The Builder.

VOL. XCIII.—No. 3372. SEPTEMBER 21, 1907.

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A World-Style in Architecture.

EVER since the period of the Gothic revival in England, we constantly hear, from those who think seriously of architecture, of the necessity for cultivating a truly national style. This idea, in fact, was one of the prominent arguments with the Mediæval party during the time when the Gothic revival was struggling into existence. This was the revival, it was urged, of our true national and indigenous style, as against the foreign importation of the Renaissance. The constrast was not quite so decided as it was generally held to be, since Gothic architecture had its rise and its true home in France, though it assumed in this country some peculiarly English forms; while on the other hand, both early and late Renaissance in England took a certain special character distinct from that of Italy and France. But no doubt there is in the distinctive character of English Gothic sufficient ground for defining it as, more than any other, the national style.

The Gothic revival has faded away; but it has left behind it, among other influences, this ideal as to a national style; and we frequently hear the regret expressed that we have no national style now, with the conclusion that there is no true life possible for English architecture until we can again evolve something which can be recognised as a national style. With the feeling which prompts this we have a good deal of sympathy; at the same time we believe that the idea of a national style is, for the present age of the world, an illusion, at all events for civilised countries. It implies a state of things which is in contradiction to the whole trend of life under modern conditions of increased facility of travel and intercommunication between civilised countries.

Some light is thrown upon the argument by considering the subject of costume. As more than one eminent writer on architecture has pointed out (Fergusson in particular), there is a good deal of analogy between fashions in dress and fashions in architecture. In the Mediæval period, when countries were much more separated from each other than they are now, one style or manner in architecture succeeded another, by a kind of spontaneous development, very much as one fashion in dress succeeds to another, without anyone knowing exactly why, or who was the originator of it. Season fashions in ladies' dresses still succeed each other in the same kind of manner; but costume as a whole more and more tends to assume a general type. Special costumes indicative of special rank or trade, which were the rule in the Middle Ages, and which Ruskin wanted to see re-established as an element in the picturesque of life, have lapsed, except in regard to the mere working dress of those who labour with their hands in occupations which may require some special article of dress for cleanliness or protection; and even such craftsmen, if you see them in their holiday attire, know no distinction of dress. The distinction in respect of rank has entirely disappeared; except at official functions (where the costumes are mostly survivals), there is nothing in dress to distinguish a peer of the realm from a bank clerk. But what is more to the purpose, the geographical distinctions of civilised dress have been all but eliminated. What is considered as the dress of a gentleman is now pretty much the same in every part of the civilised world.

And is it not inevitably becoming the same with architecture? Rural cottages in different countries have their own local style, arising often out of local material; but a design for a town hall, a post-office, or a dwelling-house of the better class, might be equally in place in London, Vienna, St. Petersburg, Paris, or New York. And that this similarity should go on developing rather than decreasing is inevitable. The same rules of conduct, the same dress, the same general requirements of daily life, tend more and more to pervade the civilised world. Even the Japanese are fast beginning to change their picturesque and characteristic costume, which in a pictorial sense exactly suits them, for garments fashioned on the European tailors' model. We may regret this; we may think that the world was much more picturesque when each country had its own costume; but we are quite powerless to prevent it. And we are equally powerless to prevent it in the case

of architecture. The same social conditions produce the same effects. Intercommunication has melted down the national social characteristics, as it will some day fuse language into one whole. That day is still far distant, but it will unquestionably come sooner or later, and there will be a world-language.* Architecture being, like the arts generally, independent of language, is in a much more advanced stage in this sense; and we are already almost on the eve of an admitted world-style in architecture.

And what form is the world-style likely to take? In the first instance, undoubtedly, the form it is actually taking now; a style based on classic architecture, with a certain freedom of treatment, and an effort after a greater adaptation to the special circumstances and requirements of a building. American architects have shown some excellent examples already of classic forms modified in respect of the special treatment which should express the purpose of a building. Even their high buildings, often rather feebly designed in comparison with the effect which might be got from them, are mainly on classic lines. And it seems to follow, from the present situation, that tradition will still retain a large hold on architectural design. The oddities which one comes across in some German designs, and the examples (not very numerous) of *Art nouveau* in France, are not likely to affect world-architecture permanently; they will die out again. What Dr. Johnson said of literature—"Nothing *odd* will do for long," is equally true in art, and perhaps in no art more than in architecture. The oddities in literature can be dropped out of sight and forgotten; those of architecture remain for a permanent annoyance and warning, which is likely to have its effect in discouraging the repetition of such æsthetic unholinesses.

A world-tradition in architecture, founded on classic tradition but open to development in accordance with new conditions of life and new methods of construction, seems, therefore, a not improbable or unhopeful new starting-point. Those who fix their longing on having national styles again will urge, probably, that without national style a great source of diverse character and interest must be lost. If so, they must be content, or at all events resigned, to lose it, because the æsthetic and social isolation necessary for the development of a national style can no longer exist. But architectural character does not depend only on nationality. It has other sources; two in particular—first, the planning and designing of buildings to suit and express their purpose; and this may be carried out without losing sight of tradition. Second, the influence of materials and methods of construction. Natural materials vary with locality, and if properly treated, at once suggest special architectural character. Artificial methods, such as re-inforced concrete, are no longer the property of any one country. Whatever is useful and practical in such methods goes all over the civilised world now; has its agents in all countries where building on a large scale is practised; so these processes also lend themselves to the idea of a world-architecture. But these also may furnish suggestions for new architectural character. Tradition modified by new construction may open a new chapter in architectural history. But tradition must be at the base of it.

In the meantime, surely the idea of a civilised architecture with a world-wide development, practised all over the world on the same lines and with the same artistic aspirations, is rather a grand and inspiring one. A purely national architecture, it must be remembered, however interesting to the patriotic mind, means limitation. In a sense, an especially "national" art, of whatever kind, is an imperfect art; one which has failed to recognise and assimilate the ideas of other nations. The highest and most monumental works in poetry, painting, and sculpture are cosmopolitan rather than national in their appeal. We hardly think of Titian as an Italian painter, or of Shakspeare as an English poet, or of Molière as a French dramatist. Jean Goujon is a French sculptor, if you like; but Michelangelo is not an Italian sculptor; he is Michelangelo, simply. No single country is big enough to hold him. These supreme artists belong to the world at large. So we think the day is not far off when architectural style will belong to the world at large; not the style of England, or France, or Germany, but the style of this planet.

*We are not, of course, thinking of "Esperanto" and other barbaric language freaks of that kind, which can lead to nothing permanent; but of the gradual interfusing of the existing historic languages into a common tongue, in which English may possibly be the principal element.

THE RAILWAYS AND TRADE UNIONISM.

FROM meetings which took place last Saturday it is obvious that that section of the Trade Unions known as the Amalgamated Society of Railway Servants is determined to avail itself of the powers recently conferred upon Trade Unions, and to try its strength. This being the case, it is important that the public, which will suffer great inconvenience if a strike is resorted to, should appreciate beforehand the exact state of affairs.

Although this Society places in the forefront a catalogue of grievances and suggested reforms which it alleges that all railway servants are agreed upon, the real issue, as was candidly admitted by the Chairman at the meeting held at Manchester, is whether the railway companies are to be compelled to recognise the Union, or whether they are to be allowed to arrange matters with their own servants. The public will do well to remember that but a small number of railway servants are members of this Society. It has been stated that out of a total of 581,000 men employed on railways, only 90,000 are members of the Society. Mr. Richard Bell was unable seriously to dispute these figures, but he alleged that they did not apply to this dispute because it was limited to those engaged in the manipulation of traffic, but he himself admitted that the number of men so engaged would be some 220,000, out of which the Society but numbered some 97,000. A ballot is now to be taken in the Society, by which it is to be decided whether the demands of the Union are to be insisted upon. It is not hard to foretell what the result of the ballot will be, and the effect will be that some 97,000 men, assuming Mr. Bell's figures to be correct, will dictate to the whole body of railway men, some 581,000 in number, what their policy is to be, using "peaceful persuasion" and the other methods of coercion only known to this highly civilised age, not only to bring about a strike, but also to bring the non-union men into the fold of the Union, when by means of the Parliamentary levy they will be compelled to subscribe to the socialistic policy recently aired at the Trade Union Congress. The public will also do well to bear in mind that the railway companies are in a very different position to some other employers. The Government, for instance, when putting contracts out for tender, now enables the Unions to know the names of the firms who are contracting; but if the firms tender too high owing to the pressure brought to bear by labour, the contracts are placed abroad, where less stringent labour conditions prevail. The railway companies cannot, however, thus resort to the cheaper foreign markets, and they will require the support of the public in the struggle now pending as to whether or not Trade Unionism is to be supreme.

NOTES.

The Quebec Bridge Disaster.

AS MIGHT be expected, various suggestions have been made to account for the failure of the great cantilever arm in the Quebec bridge. Defective material has been put forward as a possible cause; but it is more than probable that the committee of experts now investigating the matter may find the true explanation in the development of stress in some way or to an extent not contemplated by the designers. Mr. Theodore Cooper, of New York, the consulting engineer, while believing that the work as planned was absolutely safe, is reported to have said that in dealing even with an old type of work on a hitherto unparalleled scale new and unexpected problems are apt to arise, and that one cannot prophesy with infallibility about absolutely new things. We should not like to suggest that the designs were otherwise than sound or that insufficient factors of safety were adopted. Still, there is a wide gulf between British and American engineering designs—a point which is illustrated by the following quotation from some remarks made by Mr. Cooper himself at a meeting of the Engineers' Society of Western Pennsylvania in June, 1891. The words then used were:—"You all know about the Firth of Forth bridge—the clumsiest structure ever designed by man, the most awkward piece of engineering, in my opinion, that was ever constructed, from the American point of view. An American would have taken that bridge, with the amount of money that was appropriated, and would have turned back 50 per cent. to the owners, instead of collecting, when the bridge was done, nearly 40 per cent. in excess of the estimate." It is delightfully easy to talk!

A Building Contract.

THE decision in Byford *v.* Russell (Current Law Reports) is so much in accordance with the dictates of common-sense that it may be said to be hardly worth noting as a legal decision at all, but as it turned on a building agreement it may be of interest. In the building agreement the building owner, if the builder did not proceed with the work with due diligence, was empowered to give the builder notice to proceed with reasonable despatch, and after such notice the building owner was to have a lien on any plant or materials on the premises. During the progress of the work the Sheriff, under a judgment obtained by some third person against the builder, seized the plant and material. Two days after that the building owner gave the required notice and claimed to exert his lien as against the judgment creditor, but the Court held that he was too late, for until the notice was given the building owner possessed no lien or interest in the plant or material.

Motor Traffic Roads.

IN the annual report of the County Surveyor of Kent, it is stated that during the year ending March 31st last upward of 4,000*l.* has been expended in the treatment of highways with tar and the erection of motor-car signals, and a further amount of 6,000*l.*, which was due in one way or another to motor traffic. The surveyor justly points out that high speed and the use of steel studs and bands on tyres account for a large amount of the damage done to road surfaces. This contention is confirmed by a report of the Bridges and Roads Committee, who state that the evil is rapidly increasing, and call attention to the fact that the cost of tar and other materials falls entirely on the ratepayers of districts through which motor-cars travel. We are quite ready to admit the many advantages of motor traffic from the standpoint of car and van-owners, as well as from that of traders and others who derive benefit from increased trading facilities; but we do think that the time has come when the intolerable burden of special road maintenance should be shifted from the shoulders of ratepayers, and especially of country ratepayers, to the shoulders of motor-car and van owners. The best way of arriving at so desirable a consummation is for the county councils to unite in pressing the matter upon the attention of the Government, who will surely have to make a move in the direction indicated before many years have passed.

Alpine Railway Tunnels.

UNPARALLELED activity prevails at the present time in the projection of schemes for railway tunnels in Switzerland and adjoining countries. We have already mentioned the Loetschberg tunnel as a coming addition to the Mont Cenis, the St. Gothard, the Simplon, and the Hauenstein tunnels, but seven or eight other schemes are on foot, including those for the construction of a tunnel parallel to the Simplon, a similar work beneath the Jura, another through Mont Blanc, and a new tunnel at lower level in place of the existing Hauenstein tunnel. It seems wonderful that there should be sufficient return for the heavy expenditure involved in the execution of such works to justify so large a programme, but there can be no doubt as to the convenience afforded to the travelling public, and the benefit reaped by countries depending in no inconsiderable measure upon the money expended by tourists and visitors. The second Simplon tunnel will be slightly wider than the first, and will include a larger number of refuges, while a special culvert is to be built for the discharge of hot water. It is probable that the total cost will be not less than one and a half millions. The projected tunnel under Mont Blanc is to be rather more than eleven miles long, and its highest point nearly 6,500 ft. above sea-level. This scheme has been formulated by a technical commission of the Turin municipality, and, if constructed, the tunnel will give direct railway communication between Aosta and Chamounix.

Failure of a Reservoir Wall at Highgate.

AFTER the large new reservoir recently completed between Highgate and Fortis-green had been inspected and taken over by the Metropolitan Water Board, one of the walls failed in consequence of earth pressure. This seems to be a strange kind of mishap, for one would suppose that the designer would naturally take care to provide adequate resistance for all conditions of earth and water pressure. As the damaged masonry is said to have been so solid that it could not be demolished by hand labour and required the use of explosive, there can scarcely be any ground for attributing the failure to inefficient workmanship. A report of the occurrence in the daily Press contains the naïve suggestion that if the reservoir had been full of water the weight would have counterbalanced the pressure of the earth on the other side and the mishap would not have occurred. No doubt. But important hydraulic works are not intentionally designed with so much disregard for the laws governing stability, and we still await information giving a definite clue to the real cause of the failure.

The Tower, Wembley Park.

THE demolition of the Wembley Tower was completed a few days ago by the blowing up of the remaining leg with roburite exploded by means of an electrical battery. The contract for its removal was let twelve months ago to Messrs. Heenan & Froude, of Manchester, who erected the structure to a height of 150 ft. in 1889-90, a prize of 500 guineas having been offered for designs of a tower 1,200 ft. high in the park and pleasure-grounds, covering some 250 acres, laid out by Mr. H. E. Milner, for the late Sir Edward Watkin. In last July two of the legs were blown up with forty-two pounds of dynamite, the fall of the 350 tons of metal being directed with steel ropes attached to two gas-engines. It is a satisfaction to have seen an end of this ugly and unmeaning piece of folly. We only wish that we could hail the demolition of its prototype, the Eiffel Tower, which still disfigures Paris. Some time ago this was talked of as certainly determined on. We now hear that there is some probability of it being permanently retained for use in connexion with wireless telegraphy. That is the first use for it that we ever heard of; but it surely cannot be proposed to retain permanently, for no better reason than that, such a piece of prominent and insistent vandalism in the most artistic capital of the world!

Dr. Johnson's Home in Lichfield.

THE Johnson-house Committee ask for subscriptions towards a substantial repair, which has become necessary, of Dr. Johnson's birthplace and early home which has lately been opened as a Johnsonian Library and Museum. The house (in the Market-square, at the corner of Women's Cheaping and Sadler-street) retains much of its pristine external appearance, but has undergone some incongruous alterations within. Still, there are sufficient indications to show what the bookshop was in Michael Johnson's day, and when kept by his widow, aided by Lucy Porter; some of the old oak beams remain in good state; the modern shop window is to be replaced with a double one of the period—the old bayed window is shown in a view in the *Gentleman's Magazine*, 1785, and in E. Finden's engraving, after a drawing by Clarkson Stanfield, R.A., of the house, in Croker's edition (1848) of the "Life," by Boswell. In 1887 Mr. James Henry Johnson of Silverdale bought the property for 800*l.*; he put it into repair, and by his will empowered his representatives to sell it to the Lichfield Corporation, or to any one who would preserve it. Thirteen years afterwards Alderman John Gilbert acquired the house for presentation to the city of Lichfield, in the custody of the Council. The house was built by, it appears, Michael, Dr. Johnson's father, upon land owned by the Corporation, who, on July 13, 1708, agreed to grant him a lease of the encroachment of the property for forty years at a rent of 2s. 6d. per annum. At the time of his death (1784) Dr. Johnson owned the lease, which had been renewed to him in 1767 by the bailiffs and citizens for a further term of ninety years, at the old rent, and without payment of any fine.

Royal Photographic Society.

THE exhibition of the Royal Photographic Society, at the New Gallery, does not impress one, like the "Photographic Salon" last week, as showing any attempt to elevate photography to the position of "art"; at all events the trade element, which was completely absent from the Photographic Salon, seems to pervade the whole show at the New Gallery. What would be thought of an exhibition of the Society of Water-Colours, for instance, at which dealers in artists' materials were allowed to have stalls to display their wares? Apart from this, the general exhibits in the West Room have, on the whole, as much relation to art as those of the Photographic Salon, and include photographs which exhibit careful choice of composition and point of view, and successful efforts at producing effects of distance and light. Snow landscapes, such as No. 16, seem to form very favourable subjects for bringing out the best powers of photography. There is an

effective street scene by Mr. C. F. Stuart (92); a good architectural composition is shown in Signor Feledi's "Motive from Bruges" (111); and Mr. Mortimer's "A Freshening Breeze" (133), besides being a very satisfactory and well-balanced photograph, suggests one of the uses of photography in obtaining records of the movement and shape of sea-waves for study. The artist sketching can only see this movement for an instant and try to retain it in his memory; photography can fix it for him. The attempts to make ideal heads and groups show the usual failures, with a partial success here and there, as in Mr. Arthur Marshall's "At the Window" (17), Mr. Grindrod's head of a woman under the title "Beyond" (31), and Mrs. Barton's cleverly arranged and lighted group of three girls entitled "The Fates" (130). On the other, the entire failure of photography to make the idyllic is shown in Herr Gottheil's "Morgensonne" (164), with the awkward commonplace figure at the window; and as to *genre*, the hideous photograph of a group of low-looking people in "Kartenspieler" (267) shows the difference emphatically between photography and art. Teniers and Ostade painted boors, but they put something into the scene and the personages which photography cannot put into them. The experiments in coloured photography belong to the scientific side of the subject, to which we may return. But the exhibition as a whole serves to intensify one's feeling as to the gulf that separates photography from art.

AFTER TWENTY YEARS.

A COLONIAL *confrère*, revisiting his native land after an absence of about a quarter of a century, has sent us a few notes and impressions made in Europe and in England. Such notes are naturally inspired by the changes and developments which have taken place between the mid-Victorian era and the present—changes far greater than those referred to by the immortal novelist from whom we have borrowed a title, as occurring during a similar period of time in the Europe of the XVIIth century.

Coming from the East on his homeward journey, our colonial architect made a rapid tour through Europe by way of the St. Gothard Railway, returning by the Mont Cenis route.

An architect landing in Italy must always feel an irresistible attraction to the "home of the fine arts," and the development of that flourishing country at the present day affords a special interest from a comparative standpoint. During the past quarter of a century the Italians have changed in many of their characteristics, and this is represented very well by the altered appearance of their towns. Twenty years ago an Italian city was still a mass of crowded apartment houses, intersected by narrow streets, which were supposed to have the advantage of keeping the houses cool in summer heats. Nowadays, all this is being changed, the old towns have been cut through in all directions by wide boulevards, and immense suburban districts have sprung up in branching arms along the tramcar routes which issue from old city gates. Our traveller notes one very singular thing in this vast outgrowth of suburban houses. Everywhere in Italy, as in other parts of Europe, the type selected for imitation or adaptation is the little two-storied "villa" of the neighbourhood of London. With few modifications the Italian has adopted the suburban life of the Englishman, the separate household, the little patch of front garden, and back yard; and even the style of building is as nearly the same as may be, considering the difference in climate, and the necessity for stout Venetian shutters to keep out the light and heat.

The splendid idea of converting the Roman Corso into a grand triumphal pathway from the Porta del Popolo up to the Capitol and the immense monument of Italian unity is at length being realised, and it is perhaps the most important work of a colossal character in modern Italy; it affords yet another instance of the changed social conditions of the country since the era of a popular government and free institutions began. The Corso seems a narrow thoroughfare for the purpose, but this is compensated for by the magnificence and scale of some of the old palaces, and by a certain Italian character in such narrow streets. The great piazza Colonna, with its enlargement on the south side, forms an agreeable break in the street's length. The monument of Italian unity in the newly-arranged piazza Venezia is now sufficiently advanced towards completion to admit of criticism. It will certainly form the most remarkable piece of city planning of the present day. The transformation of Paris under the first and second empires was hardly so ingenious, because, in the case of Rome, a mass of ancient accumulations on a most difficult site had to be dealt with. The position of the Corso was taken advantage of, and what used to be a barrier to circulation in the form of a steep ascent, has been converted into a most imposing monument. The architectural details of the great monument are not, perhaps, very interesting or remarkable. The Timeworn *motifs* of the "Classic" style, the usual commonplace trophies, and an elaborate finish of detail, give the work a mediocre character. Its success will lie in the general effect, in combination with surrounding arrangements of street and open space. The colossal figure of the king on horseback forming the centre of the whole will be a curious feature for comparison with the classic equestrian statue of Marcus Aurelius, to be found at the back of the monument on the Capitol.

Twenty years ago modern Rome was in the throes of birth. The immense blocks of flats built after what is now quite an old Italian manner were rising amongst the lovely villa gardens of the XVIIIth century city. Then came the bankruptcy of the speculative building companies, and the ancient ruinous character of the Eternal City seemed once more to be asserting a claim on the unfinished blocks. The Roman weeds began to grow on the unroofed walls and within the windowless openings. Once more there is a change coming over the city. The ruinous modern quarters are being reconstructed on a more reasonable scale, and the small villa of modern life is appearing on the scene, although not perhaps to so great an extent as in the suburbs of some other towns in Italy.

In passing through Florence our traveller was amazed at the change since he knew the "Lily of the Arno" as a youthful visitor. Twenty years ago the train skirted the city boundaries, passing through fields where scarcely a trace of a suburb existed. Now, on the contrary, the railway is thickly surrounded with new streets of small houses, and an abundance of the inevitable "villa residences," which have, however, very little in common with the ancient villas for which Florence was at one time so famous. On the south of the city the spread of the small houses is also most remarkable; this is accounted for by the development of suburban steam trams and a separate railway.

At first sight, the great change from the "flat" to the "villa" mode of living now going on in Continental countries, appears like an unprecedented novelty. But the flat system of building a Continental town is not of any great antiquity; it came into vogue at a time when manufactures and industries were attracting the rural populations to the towns; in olden days each citizen possessed his separate house, much in the same way as in English town life. The still lingering use for walled cities during the XVIIIth and XIXth centuries would also account for the crowding of the inhabitants in tenement houses.

Passing rapidly through North Italy with its innumerable new industrial centres, its intricacies of tramways and electric railways, its exuberant display of agriculture and scientific gardening, our traveller alighted at the now favourite stopping-place for northward or southward bound tourists—Lugano. Here a practically new Central European town of considerable size has come into existence during the past quarter of a century. Monster hotels form the greater part of the mass of buildings which occupies the sides of the valley where a stream issues into the lake. The railway-station, which in 1880 stood a long way from the town—it had just been built for the St. Gothard Railway, at that time in course of completion—is now surrounded with houses and shops, and the characteristic Swiss pensions. The total area covered by modern Lugano is, perhaps, thirty to forty times the size of the old town. Electric trams and funiculars are, of course, in evidence on every hand.

In the neighbourhood of Lugano our architectural traveller passed a few days endeavouring—alas! somewhat vainly—to revive his impressions of Swiss rambles in youthful holidays—the seventies and eighties of the past century. It is, however, very difficult to imagine that anyone can gain much pleasure or satisfaction from a tour in Switzerland at the present day. The object which attracted the tourists of former times was a vacation to be spent in the loveliest of scenery, with the opportunity of studying foreign and perhaps more primitive ways of life amongst agreeable surroundings. Such motives towards a tour on the Continent can hardly be said to exist any longer. The increase of railways has destroyed much of the charm of Switzerland, not merely by the cutting up of the landscape with engineering work and the building of huge hotels on every point of vantage, but by the attendant evil of advertisements. Glaciers decorated with the names of hotels, rocks painted brown to resemble huge lumps of chocolate with the name of some patent variety in large white letters, not to mention other choice developments of modern taste, have very much changed the aspect of Switzerland from what it was like twenty years ago. The convenience of being raised to a dizzy height amongst the alpine snows by means of a railway may compensate for the uglifying of the landscape in the opinion of some, but to our returned colonist the pleasurable experiences of youthful days were no longer to be realised. The rising generation can, in fact, hardly be expected to appreciate the charm which their immediate forefathers experienced in viewing foreign scenes, and more especially in studying foreign architecture in the days of the "Gothic revival."

An excursion to Como was rewarded with the sight of one of the largest printed advertisements probably ever attempted. It consists of letters which, judging at the distance of the width of the lake, are probably about 50 ft. or 60 ft. in height, painted in white on a blue ground on a wall built for the purpose, at a point halfway up the mountain which overshadows Como. This remarkable eyesore will possibly remain for generations to come, long after the patent medicine to which the advertisement refers has ceased to be used. This, however, is a mere sample of what is going on all over Central Europe. How is it possible, demands our unhappy architectural traveller, to admire, for instance, the beauty of such a refined design as that of the Duomo of Como, backed up with the appalling monumental advertisement posters which are now covering the mountains surrounding the city? And then to think that some of these remarkable developments of advertising are as permanent as the old castles and ruins with which they vie in the landscape!

To a man who had left Europe twenty years ago with happy associations of long vacation rambles in Continental cities, where unrestored buildings might still be found, and the object of an architectural tour was to study—perhaps to "crib"—some little-known relics of mediæval art, the changed conditions of the present day are bewildering. The position and the base of art study is no longer the same. There seem hardly any unrestored monuments left in Europe at the present day, and therefore the modern architectural student, when he takes his foreign tour, will, to some extent, have to do so with the idea of studying the art of restoration as practised during the XIXth century. Many of these XIXth century rebuildings are now so dilapidated and begrimed with smoke that it would take a greater experience than that of an ordinary student to find out if there is any ancient work existing in these professedly ancient monuments. Many of Viollet-le-Duc's remarkable reconstructions can only

be detected by an experienced eye—they are already becoming venerable with dirt and decay. In the notes before us, reference is made to several of the buildings in Paris which illustrate this fact. Notre-Dame and the Sainte Chapelle were, to a great extent, rebuilt in the middle of the past century; they have now the appearance of being as old, at least, as the Louvre. The stone selected for the Sainte Chapelle by Viollet-le-Duc must have been a singular variety; it has turned of a most curiously intense black colour, although it may not have decayed so much as some other buildings in Paris of the same date.

Our architectural critic was not impressed with any particular beauty about modern Paris. It seems like an overblown flower from which all freshness and vitality have departed. Twenty-five years ago the "Haussmannising" of the old city was coming to an end, and the Paris of that day was looked up to as the model of all modern and modernised Continental cities. But the singularly well-defined character of XIXth century Paris is passing away. As in other Continental centres, the people are flocking to the suburbs, and the "suburban villa" style of life. The old fortifications of Paris no longer contain the town, but on every line of railway leading to the capital suburban stations have sprung up within the last few years, and the country for square miles outside the old limits is cut up into building plots. The suburban Parisian villa much resembles its London prototype, but the neighbourhoods being newer have often a forlorn, treeless appearance.

The climate of Paris has become more like that of London—perhaps from the same causes. The blackening of the buildings after twenty years of smoke is remarkable, and this unfortunate characteristic of most modern cities seems to have been taken advantage of for a very sordid commercial purpose. Everywhere in the streets—at least in all streets not lined with houses of a very superior class—the grimy stonework is made to serve the purpose of a background to endless rows of white enamelled letters, forming the names of persons who carry on business on the different stories of the houses. To a stranger this method of advertisement is very striking, and, in its modern developments, certainly less than twenty years old. The system must eventually defeat the object in view, on account of the prodigious quantity of these white enamelled letters and advertisements. In some of the Parisian streets a nightmare effect of some Gargantuan spelling game is produced, and the weary gazer, on whose brain become printed such words as "Dentiste," "Modes," etc., endeavours to shut out the sight.

A few—far fewer than might have been expected—efforts to introduce the absurdities of the "style nouveau" attract (or, more properly speaking, repel) the traveller's attention. A large example occupies a prominent position on the bank of the Seine near the Pont d'Iena.

Landing at a southern seaport—one of that long line of settlements on the south coast of England chiefly tenanted by persons who have retired from the active life of the colonies, or who have inherited the savings of a past generation—the visitor is duly impressed with the substantial prosperity and respectability which meet the eye at every turn. Here few evidences of the ugly commercialism of more northern towns are noticeable. To pass from the Continent, with its still surviving traces of the Middle Ages, into this land of the small leasehold house and the building estate of the latter half of the XIXth century, is, indeed, a great change to anyone's ideas.

In England, perhaps, the most remarkable feature in the vast growth of little two-storied houses during the past twenty-five years is the uniformity of plan and arrangements which prevails. This is, of course, due to the leasehold system on which they are built. In Paris and other Continental centres which are becoming suburban there is a certain individuality in the small houses, and very often one may observe a house only partially finished, although occupied. Speculative houses built by the dozen are still very exceptional on the Continent. In England, on the contrary, the house built to suit the taste of an individual occupant or owner is so rare as to pass unnoticed amongst the tens of thousands of modern villas and cottages erected by the speculative builders of the last twenty-five years.

As London is approached on its southern side, the remarkable character of the modern English mode of living in suburban cottages becomes apparent. London seems to the foreigner like some monstrous overgrown village, or collection of villages, with interminable rows of little two-storied cottages, interspersed with fields, commons, parks, etc. All that once constituted a town or city in olden times, and in the olden sense has, of course, long since been swallowed up in this gigantic labyrinth, and the country thus transmogrified is inhabited by people who, to judge by the singularly stereotyped appearance of their homes, are content with as remarkable a stereotyping of their domestic arrangements. Another thing which astonishes the visitor to London after a lapse of years seems to be the similarity in size of the modern suburban houses, as compared with former times. This may be due to the greater number of a medium size having been built of late years, perhaps filling up a gap between the wealthier and poorer classes of the community. The "flat" system of building, so characteristic of Westminster, has not developed in anything like the proportion of the suburban villa and cottage style. The English can hardly be said to have ever really adopted it—at least, on the scale of Continental nations—and it remains merely a form of "chambers" or "apartments."

The American idea of building with a prospect of very transient existence, is evidently gaining ground in Europe. Even large buildings of recent date are now often sacrificed to some passing necessity in a way which would have seemed strange but a few years ago. At the same time, it is curious to observe insignificant fragments of the past still standing in positions which one would have supposed it impossible for them to survive.

The immense alterations in the Strand appear to the visitor as an unmixed blessing. Light and air are let in on a district which had been a squalid disgrace to London for more than a century, and it is to be hoped that many other parts of the metropolis may be treated in the same way—there are still plenty of sites which require such measures. Instances of progress in London improvements, such as the Strand, the Charing Cross-road, etc., meet with our travelling architect's high approval; but, at the same time, he notes unfavourably certain of the architectural developments springing up on these new sites. Allowance has to be made for the difficulties which modern architects meet with in clients who insist upon vulgar display and extravagance, and who, moreover, wish to pay for such things without stint. Many of the new designs appear to be departures into mere ugliness, although the absurdities and deformities of the "Style Nouveau" have fortunately not been hitherto attempted to any great extent in England. As a whole the rebuilding of London streets furnish but comparatively uninteresting repetitions of the so-called "Queen Anne" style, a style full of a certain character, although it has become terribly vulgarised in its very general adaptation to every conceivable use, from public-houses to palaces. Perhaps, however, we ought to regard it as the truly national artistic expression of England, and its very general application as but a natural result. Unfortunately, it is commonly made use of with a lack of taste and an incongruity of detail which produces anything but a pleasing effect, the only compensation and consolation being that it is at least an improvement on the hideousness of the "streaky-bacon" Victorian Gothic which it has supplanted.*

ST. MARY'S HALL, COVENTRY.—Proposals are made to effect a reparation of the leaden roof and the stone work of St. Mary's Hall, one of the chief objects of attraction and interest in Coventry. The hall, standing on the south side of St. Michael's Church, was first built in about the middle of the XIVth century by the Guild of St. Mary, afterwards absorbed in the Guild of the Holy Trinity. The hall has latterly served for uses of civic entertainment, the council meetings of the Corporation, and the deposit of the muniments of the guilds and of the city, which rank amongst the most important collections in England.

* To be concluded in our next issue.

MAGAZINES AND REVIEWS.

IN the *Burlington Magazine* the serial article under the heading "The Case for Modern Painting (V.)" is ostensibly a review of a small book by Professor Joseph Strzygowski—"Die Bildende Kunst der Gegenwart" ("The Plastic Art of the Present Day"), described in the sub-title as "A book for everyone." The writer of the article, who is a painter and confesses to knowing nothing of architecture beyond the position of "the plain man who 'knows what he likes'" (a confession, as he observes, "of little interest to other plain men"), is quite right, however, in one or two of his architectural criticisms. He says truly that for Strzygowski to mark for approbation a power-house chimney at Dresden, on the score that at an enormous cost it has been made to appear like the tower of a church in the Middle Ages, is "a topsy-turvy view of things." "The drollest result," he adds, "of such ambitions is to be seen in our Tower Bridge, which, after many years of trial, we have found to be neither virtuous nor necessary [alluding to the proverbial phrase, "to make a virtue of necessity"]. The iron structure of the towers has been masked with imitations of the adjoining Tower, a vicious procedure involving great expense." We are glad to find this absurdity, against which we protested from the first, recognised by any writer on art; only the author does not seem to be aware that this is engineer's and not architect's work; the architects hate it as much as the painters do. In regard to painting, Strzygowski's charge is that the painters of the present day are too much occupied with technique, which in regard to the most modern race of painters we should say was perfectly true—they even declare it ostentatiously; execution is everything, subject of secondary consequence. The *Burlington* critic takes the opposite view; he thinks our painters are not lacking in ideas—literary, religious, mythological; "but that in technique they are immeasurably inferior to the most unknown and in some respects even contemptible painters of the past." The author, as a painter, should know more of technique (in painting) than an architect can profess to know; but we should say that this is rather an exaggerated charge, except perhaps that some of the younger school of painters wilfully leave paintings in a rough state of technical finish, from an over-acted contempt for realism. The best technique seems to be shown in the recent paintings which make the least claim to æsthetic significance. A good many interesting points are raised in the article. Mr. Tavenor-Perry contributes an article on "The Spires of Rome," with sketches of his own. The title suggests an idea of the *coup d'œil* of Rome rather at variance with one's general associations; and in fact most of the examples drawn are hardly to be called "spires," they are rather pyramidal roofs; but the sketches and the remarks are of interest. The number has as a frontispiece a chromolithograph reproduction of Reynolds's "Nelly O'Brien." The coloured plate forms part of a series of reproductions issued by MM. Seemann, of Leipzig.

The *Architectural Record* (New York) starts with an article on "Some Recent Skyscrapers"—in New York, apparently. The illustrations serve mostly to show how very little has been made of the opportunities for powerful architectural effect which these abnormally high buildings, whatever their drawbacks, ought to furnish. The architectural design is for the most part of the most commonplace kind. One exception, the Title Guarantee and Trust Company's building, is interesting as showing an effort to give dignity and importance to a building situated between two loftier ones, by the use of an order on a large scale, running through five or six stories. As the author, Mr. Montgomery Schuyler, observes, it was a question of architectural scale as opposed to mere height. This building, however, though high enough, hardly comes under the denomination of "skyscraper" as usually understood. "A new type of City House," treated of in the next article, appears to be a house built by Mr. Ernest Flagg, the well-known architect, for himself. We do not quite gather in what sense it is supposed to be a new type; what is evident is that the simply treated brick front, with a strongly marked stone modillion cornice, some modelled decoration in the arch heads over the first floor windows, and a

delicately designed metal railing to the balcony beneath them, is an excellent piece of pleasant and unpretending street architecture; perhaps it is its quiet and unpretentious character that constitutes it a new type for New York. The plan, that of a narrow street house, is interesting too; on the ground floor a passage on the right, entered by folding gates, brings the owner's or visitor's automobile, by a kind of long tunnel-like porte-cochère, right into the interior of the house, where, after discharging its passengers into the hall, it goes on into a compartment with a descending lift to the basement, whence it reaches the private garage at the back. The dining-room on the first floor, at the back, is a large oval room with axes of 30 ft. and 27 ft. in length. We should imagine the whole to be an exceptionally good specimen of a town house on a confined site. Mr. E. K. Smith continues the subject of "The Transformation of Paris under Napoléon III.," this article being still concerned with the plans which preceded Haussmann. It is noteworthy that not only the line of the Avenue des Champs Elysées, but the *rond-points*, that near the art palaces, and that which now sweeps round the Arc de l'Etoile, are shown on Perronet's plan dated 1782, with the continuation of the axial road through Neuilly to the radiation of roads near Courbevoie. Everything had pointed, for nearly a century before, to the species of Parisian improvement which Haussmann carried out.

Dr. Ludwig Hess, in *Concrete and Constructional Engineering*, traces the "Historical Evolution of Reinforced Concrete in Austria," a country distinguished as one of those in which the new material was first applied on a practical scale, and whence much valuable aid has been forthcoming in the way of research and scientific writings. An article dealing with a new dock on the Clyde concludes the series on "Reinforced Concrete Wharves and Quays," by Mr. Twelvetrees, the particular example of construction here dealt with being noteworthy as a new departure in marine engineering which will probably serve as a stepping-stone to other works of similar character. An admirable illustration of concrete-block construction as applied to bridge building is furnished by the Connecticut Avenue Bridge in Washington, a structure which is described from particulars, photographs, and drawings furnished by Mr. W. J. Douglas, the Engineer of Bridges to the city mentioned. The new cathedral in Manilla, designed by Messrs. Sturgis & Barton, architects, Boston, U.S.A., forms the subject of a short article. So far as we can judge by the photographic views and drawings reproduced, both the exterior and the interior of the building are of effective and pleasing character. Some interesting dome and arch construction are illustrated, but the drawings give very little information likely to be of practical use to architects desiring to apply reinforced concrete to work of the same kind. Among several other short articles devoted to recent uses of concrete we may specially mention one giving structural details of a factory building at Leicester, a class of structure for which reinforced concrete is particularly suitable.

The *Fortnightly* contains what appears to us either a somewhat disingenuous or a somewhat illogical article by Mr. Alfred Fellows, on "The Trade Disputes Act and Freedom of Contract," the general aim of which is to defend the recent Act as being only what was required to put the Labourer on a fair footing with the Employer. He attempts to persuade the reader that the "freedom of contract" which is claimed by the non-union worker, or the conventionally labelled "black-leg" who refuses to strike, is a mere illusion, because the very word "contract" implies the power of the law to interfere to prevent it being broken, otherwise it amounts only to a promise. This seems to us a barefaced instance of the use of "ambiguous middle term"; the phrase "freedom of contract" being adroitly used by the writer to signify both freedom to enter into a contract and freedom to break it. So he argues that because a man is not free to break a contract having once entered into it, therefore he was never free to enter into it! That is what his argument comes to, if words mean anything. It is one of the most adroit pieces of special pleading that we have come across; but we do not think it will convince any clear-headed person. The plain English of the matter still remains, that in a free country every man has a right to refuse to join any organisation if he does not wish to do so, and a right to accept work on terms that satisfy himself, without being subject to persecution for it. That is his "freedom of contract"; he is free, not to break any contract when made, but to enter into any contract he pleases. The attempt to include the two processes under one head as "freedom of contract" is a mere piece of verbal quibbling. A lively and amusing article by Mrs. John Lane on "Misplaced Monuments" is hardly rightly named, for her conclusion rather seems to be, not that certain monuments are "misplaced" under certain circumstances, but that all outdoor statues are misplaced in this climate; in which there is some truth. Mrs. Lane falls out with them too on the old difficulty of costume; the realistic costume and the classic blanket being equally open to criticism. This also of course is quite true; but she does not seem to realise the existence of the *via media*, so often successfully adopted in France, of confining the portrait to a bust, and accompanying it by symbolical figures which may rightly be treated with idealised drapery. That is the true solution of the difficulty.

In the *National Review* the question of realism or idealism in sculpture is touched upon, in a kind of symbolical manner, in a clever little scene by Mrs. Alfred Lyttelton, entitled "Aspasia's Statue." Pericles, Aspasia says, had maintained that no statue could equal the beauty of the living creature. Aspasia poses as a statue, to hear him praise her beauty as such; but he discovers the trick, and goes through the form of pretending to be converted, and praising the statue at the expense of Aspasia, till Aspasia's indignation breaks through her acting. But the conclusion is—"Aspasia is never more divine than when she steps down from her pedestal." It is a pretty little scene, but whether very probable or in character with Pericles is another matter.

The *Contemporary Review* contains no less than three articles dealing with artistic subjects; a very unusual proportion for an English magazine. Mr. Wake Cook's article on the very large subject of "The Purpose of Art," though it contains some suggestive and thoughtful remarks, is too vague to amount to much, and one may read it through without having any very clear idea as to what the writer conceives to be the purpose of art. We are tempted to ask—has art a "purpose"? There is hardly anything one can say about its purpose, at all events, which will satisfy all minds or cover all theories or practice of art. Turning from the abstract to the concrete in art, we find the next article to be one by the Count de Soissons on Ingres, a remarkable painter about whom very little is now known in England except that he was the painter of the beautiful bit of modern classicism entitled "La Source," so familiar by engravings, and which has been exhibited on more than one occasion in this country. It is interesting to learn that this beautiful figure, with such a spirit of innocent youth in it, was a work of the painter's old age; it is a remarkable picture for an old man to have painted. Judging from the examples of Ingres which were to be seen in the retrospective collection of the French exhibition of 1889, we should have said that he was a painter whose art was somewhat out of date now. He was a professed follower of Raphael, whom he considered the greatest of painters; and, like his great model, he was a very fine draughtsman and a rather poor colourist. But he was a power in French art in his day, and as the representative of the classical ideal was pitted against Delacroix, who was supposed to represent the romantic and rebellious school in painting. We are glad to have some more information about him than is generally accessible now, though his painting would certainly seem cold and hard in the eyes of the present generation. The third and most important of the articles referred to is that by Mr. March Phillipps on "Gothic Architecture and Gothic Race." There are no ideas in it that would be new to our readers, but it is a very well-reasoned article, such as it is satisfactory to find in a magazine for general readers, where too often architectural subjects are treated in a very superficial manner. We notice with interest, in some remarks on the essential qualities of Gothic, the observation that "no one can wander about among the courts of the temples of Karnak and Luxor without being sensible that the spirit inhabiting here is infinitely removed from the Greek spirit and much more nearly allied to the Gothic," in spite of its trabeated construction. The present writer remembers startling the æsthetic proprieties of a provincial architectural society, in a youthful paper many years ago, by the same comparison. It is refreshing to meet with it again here.

Scribner contains an article on "Siena" by Mr. Arthur Symons, with illustrations by Mr. Peixotto which are admirable, and form naturally the chief value of the contribution. To Mr. Symons's views on art we have never been able to attach much value, but he brings literary eloquence at least to the subject. "Seen after Sunset," he says at the conclusion of the article, "it is as if a great missal, painted by Sienese artists, had been set upright between earth and sky; a sky rose-coloured and blue and gold, the outlines of the hills drawn sharply against a gold background, purple-black, with depths of colour glowing through darkness and lighted at the edges with miraculous gold." Under "The Field of Art" Mr. W. H. Low describes the scheme for founding a national museum of American art at Washington, of which one or two important donations or legacies by collectors of works by American artists form the nucleus. It is intended that the museum should, like some of our London hospitals, be "supported by voluntary contributions," not by State purchases.

The *Century* contains an article by Mr. Arthur E. P. Weigall, Chief Inspector of the Department of Antiquities under the Egyptian Government, on "A New Discovery in Egypt," viz., the recent uncovering of the tomb of Queen Thiy, a discovery in which the writer took part. Some fine illustrations are given of objects found in the tomb, among which may be mentioned especially a remarkable and apparently very perfect gold diadem called here "the vulture diadem," formed of the conventionalised figure of a vulture with the wings joined above in an upward curve.

Harper contains an article by Professor Conklin, of the University of Pennsylvania, on "Photomicroscopy by Ultra-violet Light"; in other words, as he puts it, "photography of wholly invisible objects by wholly invisible light." Descriptions and illustrations of the instruments used are given. This process has made it possible for the first time to photograph and successfully investigate the structure of living protoplasm. The writer regrets that even by this process there is no prospect of the light molecules or smaller constituents of matter being photographed; "these being far beyond the reach of even the ultra-violet microscope." Possibly some day science may enable us to see molecules. It would be a matter of the deepest interest to know whether their appearance and behaviour really coincide with that which has been deduced for them by analysis.

The *Cornhill* contains a most interesting article by Sir E. Maunde Thompson on the history of the British Museum Reading-room, including some curious facts which are little known to the general frequenters of the reading-room.

The *Antiquary* gives an article, by Mr. Ernest W. Dormer, on "The Tombs of Aldworth Church, Berkshire"—nine recumbent effigies in stone, monuments of the once great family of the De la Beches. The article sums up the historical information in regard to the personages commemorated, but no illustrations are given. Mr. Oliver Davison contributes a communication on "The Norman Arches of High Wycombe," in the grounds of the Royal Grammar School, one of which, we regret to learn, collapsed in November last. There must have been a want of care and observation on the part of those in whose custody these relics are, not to have perceived that they wanted looking after. An illustration of two of the arches is given. We do not quite understand the statement that the architect to the "Society for the Preservation of Ancient Monuments" has examined the ruin, and stated that it "could be satisfactorily restored for about 100*l*." Is this the same with the "Society for the Protection

of Ancient Buildings"? And if so, how have they swerved from their principles to talk of things being "restored"?

LONDON DISTRICT SURVEYORS: RECENT APPOINTMENTS.

AS THE vacancies that have for some time existed in the office of District Surveyor under the London Building Act have now been filled up, and as the recent appointments have resulted in many changes, it will be a convenience to our readers to have a complete list of the new appointments, which are as follows:—

St. James', Westminster: Mr. L. R. Ford, 60, Haymarket, S.W.
Paddington: Mr. F. W. Hamilton, 195, Edgware-road, W.
Mile End and Limehouse: Mr. H. N. Kerr, 13, Grafton-street, Mile End, E.
Hammersmith: Mr. A. H. W. Glasson, 3, The Grove, Hammersmith, W.
St. George's, Hanover-square (Belgrave and Pimlico Div.): Mr. S. F. Monier-Williams, 83A, Chester-square, S.W.
Charlton, Lee, and Kidbrooke: Mr. A. A. Fillery, 5, Lee-road, Blackheath S.E.
City of London (East): Mr. J. Todd, Hamilton House, 149, Bishopsgate-street Without.
Holborn: Mr. W. G. Perkins, 6, Raymond-buildings, Gray's Inn, W.C.
Strand: Mr. O. C. Hills, 60, Haymarket, S.W.
Lewisham (West): Mr. W. R. Davidge, 201A, Brockley-road, S.E.
Lewisham (East): Mr. E. W. Lees, 3, Lewisham-bridge, S.E.
City of London (West): Mr. C. W. Surrey, 134, Fleet-street, E.C.
Wandsworth (West): Mr. R. Elsey Smith, Bank Chambers, High-street, Wandsworth.
Hackney (West): Mr. H. A. Legge, 360, Mare-street, Hackney, N.E.
Sydenham: Mr. G. Tolley, Bank Chambers, Forest Hill, S.E.

VACANT DISTRICTS, IN CHARGE OF INTERIM SURVEYORS.

Fulham (North): Mr. A. P. Stokes, Broadway House, The Broadway, Walham Green.
Hackney (North-East): Mr. H. A. Legge, 360, Mare-street, Hackney, N.E.
Norwood (West): Mr. A. G. Morrice, 8, Knight's Hill, West Norwood.
Streatham (West): Mr. W. H. Stevens, 186, Balham High-road.

S. FRANCESCO, BOLOGNA.

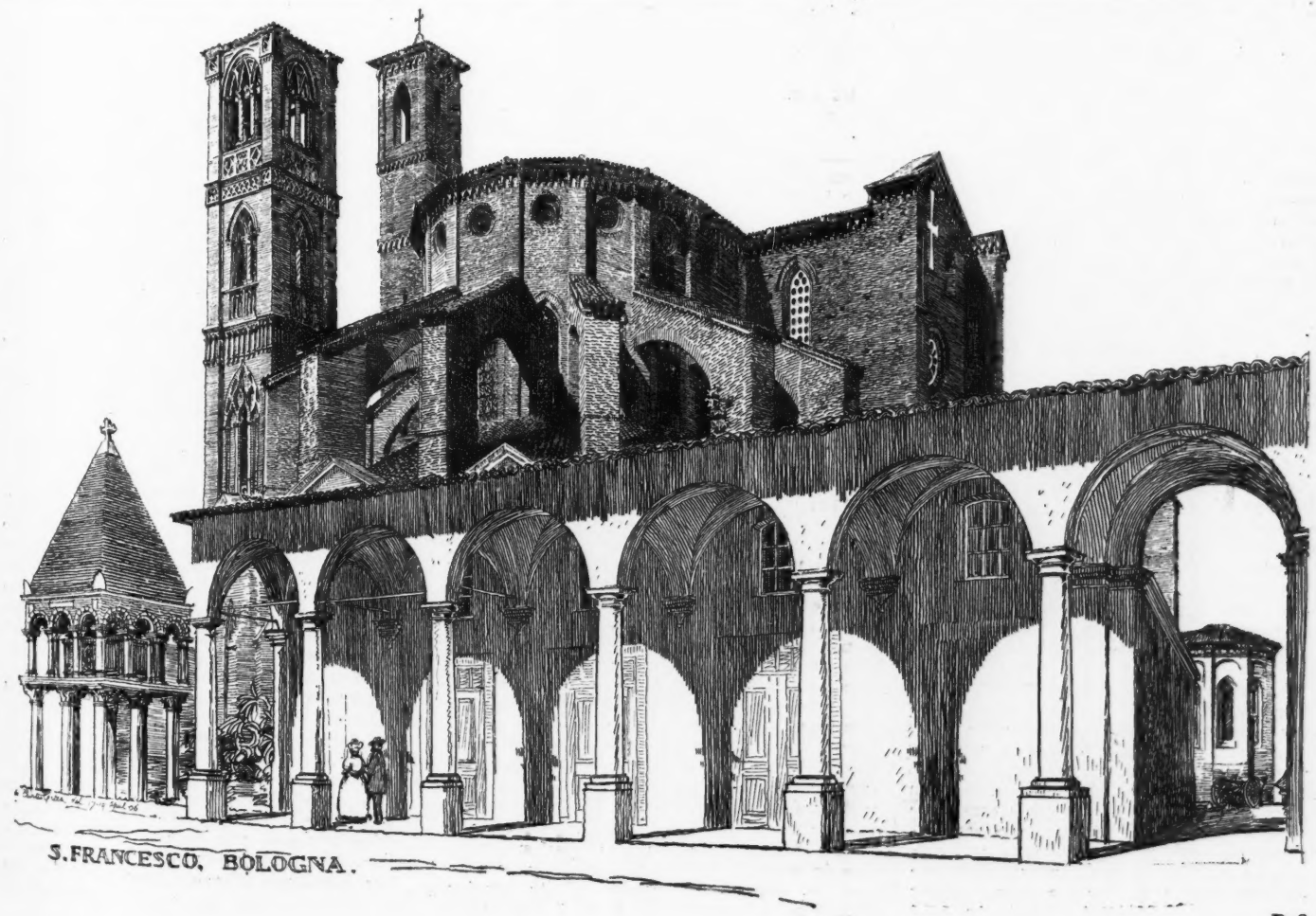
THE church of S. Francesco, in Bologna, is a pure XIIIth century Italian Gothic building; the Campanile is one of the most graceful in the city. For many years it was used as a military magazine, but was restored to its sacred uses twenty years ago, when some deplorable restoration work was done to the building. Last year, at the time the present sketch was made, the picturesque loggia shown in the drawing was being cleared away. The tomb on the left has remains of very ancient work, but it, too, has been spoiled by the hand of the restorer.

THE ASSOCIATION OF MUNICIPAL AND COUNTY ENGINEERS.

A MIDLAND Counties meeting of the Association of Municipal and County Engineers was held at Bilston on Saturday. The members assembled in the Council offices, where they were received and welcomed by the chairman of the District Council. There were present:—The President, Mr. John A. Brodie, Liverpool; Messrs. J. T. Eayrs, Birmingham; T. W. A. Hayward, Battersea; W. C. Easton, Glasgow; H. Richardson, Handsworth; A. Grove, Stonebridge; H. E. Stilgoe, Birmingham; H. Barker, Handsworth; T. H. Hailstone, Richmond, Yorks; A. J. Dickinson, Redditch; F. Bettany, Burslem; J. Lobley, Hanley; F. Fenn, Belper; H. C. Wainwright, Wolverhampton; A. D. Greatorex, West Bromwich; J. P. Wakeford, Bilston; T. Jones, Colwyn Bay; G. Crump, Hinckley; F. C. Cook, Nuneaton.

Mr. Skemp, in addressing the members of the Association, said he had much pleasure in bidding them heartily welcome to Bilston. He believed about nine years had elapsed since they last visited the town. At that time they had just finished their waterworks and their technical schools, but since then they had still been making progress. They had built an infectious diseases hospital, and, in conjunction with Wolverhampton and the district around them, they had put up a small-pox hospital, which he saw from their programme the members of the Association were about to visit. They had also erected two schools in the borough, one at Stonefield, and the other at Eltingshall. They had also spent about 52,000*l.* in sewering a portion of the town, and, of course, that meant a large sum of money for a little town like Bilston. They had spent, since the Association last visited Bilston, about 150,000*l.*, which would be a mere flea-bite for such a city as Liverpool; but it was a serious matter for a place which had only 25,000 inhabitants, and where a penny rate only brought in 300*l.* a year. The people of Bilston were now realising what high rates meant, and though they believed in progress, they never dreamt that they would have had to spend such large sums of money for educational purposes. The Stonefield schools cost them over 17,000*l.*, and the Eltingshall schools, which were only temporary, cost about 3,000*l.* They were expecting to spend about 3,000*l.* more on the schools during the coming year; the plans had already gone up to the Board of Education for their approval. They had not spent all that money willingly, because they knew that the people could not stand the strain of heavy rates. What annoyed him was to hear county councillors and members of Parliament come down and find fault with them for spending so much money, and yet they were the people who were compelling them to spend it. Members of Parliament voted away hundreds of millions, but members of town and district councils, it would seem, must not vote hundreds of thousands to make their towns attractive and beautiful. For his own part he thought it was their duty to make their towns as much like paradises as they could, and he knew the members of the Association were all prepared to do their best to make their respective towns as beautiful as possible.

Mr. J. A. Brodie, the President, thanked the chairman on behalf of the Association for his kindly welcome, and remarked that the Association contained many members who served authorities which were very much smaller than that of Bilston. The surveyor engineer in each of these districts was called upon to do almost everything required to be done in the way of designing, engineering, and construction, or a knowledge of workmanship and materials, and it was therefore very necessary for the members of the Association to visit centres where work was going on so that they might get the benefit of experience of the methods of handling men and materials which were displayed in those particular districts. It appeared at Bilston a large amount of money had been spent on sewage works. Those were works which were among the most important that came under the control of surveyors, and it appeared that considerable difficulties had been encountered there in carrying them out. They understood, however, that their surveyor, Mr. Wakeford, and their consulting engineer, Mr. Baldwin Latham, had very skilfully overcome those difficulties. The other matters they now had to show them were also matters of great interest to the members of the Association, and they



S. FRANCESCO, BOLOGNA.

thanked the chairman and members of the Council for giving them the opportunity of seeing them, and also for giving them the use of the Town Hall.

Letters of apology for absence were read from Mr. J. W. Sankey, chairman of the Estates Committee of the Bilston District Council, and from Mr. F. W. Plant. District business was then transacted.

Mr. Greatorex moved the re-election of Mr. H. Richardson as District Secretary.

Mr. Stilgoe seconded, and it was carried unanimously.

Mr. Richardson thanked the members for the further mark of their favour, and said that he would endeavour to carry out the duties of the office in the future as he had done in the past.

The members then drove in brakes to the new outfall sewerage works, which they inspected under the guidance of Mr. Wakeford and Mr. George Latham. They subsequently drove on to the South Staffordshire Small-pox Hospital, and were shown over the premises by Mr. Green, the architect.

Lunch was partaken of at Bilston at the invitation of the chairman and members of the Council, Mr. Skemp presiding.

After lunch several toasts were proposed. The first one submitted, after the loyal toast, was that of "The Chairman and Members of the Bilston Urban District Council," which was proposed by Mr. Stilgoe.

The Chairman, in the course of his reply, remarked that he had seen many changes in Bilston since he first knew it. At that time there were about 3,000 colliers in the town; he should not suppose there were 300 now. In fact, it was quite a different place from what it was some decades ago.

Mr. Harper proposed, "The Association of Municipal Engineers," coupled with the name of the President.

The President said allusion had been made that day to the cost of public works, and it reminded him that one of the objects of their Association was to educate engineers, so that any work they did might be carried out as economically as well as efficiently as possible. They had been pleased to come to Bilston and see the class of work that was carried out there. For the manner in which the work at the outfall was being done, there was great credit both on the local engineer and the consulting engineer, and the members would go away with the impression that their morning had been well spent.

After lunch the members watched a tar-spraying apparatus at work, and visited the new Council schools at Stoneford. They subsequently drove to the waterworks pumping-station, where the powerful machinery was inspected, and tea was partaken of at the invitation of Councillor Sankey, in a marquee near at hand.

In proposing a vote of thanks to Councillor and Mrs. F. S. Sankey and the ladies who had assisted in the entertainment of the members, the President said:—The works they had seen were, he thought, of a very interesting nature. The engines and pumping plant which they had just inspected, as well as the other matters which were brought under their notice that morning, were of the greatest interest to them.

Mr. F. S. Sankey responded on behalf of his wife and himself, and Mr. Came, superintendent of the pumping-station, replied on behalf of the ladies.

Mr. A. D. Greatorex said he would like to propose a hearty vote of thanks to Mr. Wakeford for the paper he had written for the occasion, and also for the privilege he had given them of seeing the works they had inspected that day. It was now nine years since they had the opportunity of visiting Bilston, and on that occasion they visited those waterworks as they had done that day. He was sure that those of them who were there nine years ago must have noticed a marked improvement there that day in many ways. What struck a good many of them was that in a town like Bilston, where the staff in the office was not very great, such a large amount of work was carried out by the surveyor. That, he thought, redounds very much to his credit. He remembered a month ago, when the elections in Bilston were on, an old friend of his was a candidate for the Council, and among the election addresses that he had an opportunity of seeing was an address by an intending candidate who rather had "a go," as the saying is, for the surveyor's department, which he said was overstaffed. From his own knowledge of it, he would say it was very much understaffed, and he thought it was only right of them to congratulate Mr. Wakeford on the excellent work which he had carried out. It was far better, he thought, that they would have an opportunity to visit such works as sewerage works when they were in course of construction than after they had been opened, as they were not then able to see the method of construction as well as they could before they were completed. At the same time, it was, of course, very interesting to see sewerage works in operation, and especially to see what sort of an effluent was being turned out. On the whole, however, he repeated that it was more interesting to see them while they were under construction, because they could then get many ideas to carry away with them and use in their own works. It would be very interesting to see the effluent that was turned out by the works they saw that morning, and those of them who live in the district would no doubt have an opportunity of doing so. He congratulated the Association on the excellent day's outing they had had, and he congratulated Mr. Wakeford on the first-class manner in which he had carried out that work.

Mr. J. T. Eayres said he would second that. He was President nine years ago when they had an opportunity of seeing the waterworks, and now after so many years one was glad to see the splendid way in which the engines were working. He considered the plant was a magnificent one, doing magnificent work, and the cost of pumping was much lower than one would have expected considering the heavy duty the engines had to do. With regard to discussing the paper or asking questions, he felt that after the splendid hospitality they had had that day, he was quite unable to say anything in that direction.

Mr. Wakeford said he did not think any vote of thanks was necessary for the paper, which he would prefer to call a few notes on the works they visited; as a matter of fact the notes on the hospital were supplied by Mr. Green, the Borough Surveyor of Wolverhampton, who was the architect of the building. He agreed with Mr. Greatorex that he was not overstaffed in his department, and he took that opportunity of expressing his thanks to the members of his staff for the able manner in which they had assisted him.

Mr. Hayward said he had great pleasure in proposing another vote of thanks—one to the indefatigable local secretary. He was sure he had shown himself an excellent secretary, and had done excellent work since he succeeded Mr. Pickering, who, he thought, must have given him some very good hints before he resigned the office. He hoped it would not be long before they had Mr. Richardson as a permanent member of the Council, and that he would bring on another man to succeed Mr. Pickering. He was sure their best thanks were due to Mr. Richardson for the splendid arrangements he had made, and their thanks were also due to Mr. Green for his part in the day's proceedings. He was sure the hospital they went over, with its admirably complete arrangements, was a great credit to him, and should an epidemic unfortunately arise, the poor people who went there would have very comfortable quarters. They also have to thank Mr. Latham for his kindness and courtesy.

Mr. Richardson and Mr. Green replied.

Mr. J. P. Wakeford, Assoc.M.Inst.C.E., Engineer and Surveyor to the Urban District Council of Bilston, read a paper on "The Bilston Sewerage Scheme." He said this scheme, which had been in course of construction for upwards of two years, comprised the laying of about seven and a half miles of intercepting sewers, varying from 9 in. to 40 in. in diameter, and the construction of disposal works at the Lunt. The population of Bilston in 1901 was 24,034. The system of disposal adopted was chemical precipitation, followed by continuous filtration, precipitation being rendered necessary owing to the large amount of acid waste turned into the sewers from the galvanising works. At the termination of the 40-in. culvert, and when it entered the engine-house, lime in solution was added to the sewage before it passed to the precipitation tanks, lime in solution being used in preference to lime in suspension, because of its greater efficacy as a precipitating agent. The tanks were five in number, 117 ft. long, 24 ft. wide, average depth 5 ft., a total capacity of 438,750 gallons, or 20·30 hours' dry-weather flow of sewage of future population. The sludge at the bottom of the tanks would be squeegeed out into the sludge culvert under the distributing channel, from whence it would flow to the sludge-pit, lifted by the pumps, and deposited in the depressions on the adjacent land.

The liquid passed from the tanks along the distributing channels to the eight sewage filters, which were 2·40 acres in extent, and designed to deal with three times the dry-weather flow at the rate of 133 gallons per square yard per twenty-four hours, the four storm filters, ¾ acre in extent, dealing with all excess above three times the dry-weather flow up to six times the dry-weather flow at the rate of 500 gallons per square yard per twenty-four hours.

The filtering medium in the sewage filters was as follows:—1 ft. hard clinker, broken to pass through a sieve of 1-in. mesh, but retained on a sieve of ¼-in. mesh; 3 ft. 6 in. mixed materials, consisting of fine, hard, crushed clinker from the ironworks, broken to pass through a sieve of ¼-in. mesh, and sandy surface soil free from clay, sifted through a sieve with 1-16-in. meshes, mixed in the proportion of one-third sandy soil to two-thirds crushed clinker.

The top of the filter was finished with a layer of 6 in. of sandy surface soil, free from clay, so as to permit the free passage of the sewage without clogging the filter.

The storm filters were of similar design, but the middle layer of mixed materials was 1 in. less, and the surface soil on the top 4 in. thick, a total depth of filtering medium of 4 ft. 9 in. Perforated pipes were laid in the bottoms of the filters conveying the effluent to the carriers, and thence to the 12½ acres of land before discharging to the brook.

Half-round pipes were laid on the top of the sandy surface soil for distributing purposes, each pipe being controlled by a disc-valve in the walls of the distributing channels, and by stops in the pipes.

Great care had been necessary in the selection of the sandy surface soil, since, if taken from any considerable depth, it did not contain the organisms necessary for purification purposes.

The machinery comprised two oil-engines, each capable of developing 6½ brake h.p. at 250 revolutions per minute; two horizontal, double-acting, single-cylinder guide-pumps for filtered water, 5-in. bore, 12-in. stroke, delivery 58 gallons, at forty revolutions per minute; two sets of horizontal, three-cylinder ram pumps for sludge lifting, 8-in. bore, and 18-in. stroke, each set delivering 350 gallons at thirty revolutions per minute. Two lime-grinding mills and lime-solution mixing cylinders had also been provided.

Very great difficulties were encountered in the laying of the intercepting sewers in the main thoroughfares, owing to the presence of old colliery workings, and at one stage of the work it was necessary to temporarily shore the Lichfield elevation of the Town Hall, and afterwards to carry out special works to ensure the safety of the building.

Arrangements had been made with the Wolverhampton Corporation for draining certain properties within their district which were at present unsewered into the Bilston system.

The total cost of the scheme when completed would amount to about 52,000*l.*

The South Staffordshire Joint Small-pox Hospital, which was opened on December 4, 1905, had been erected at Bradley in the Urban District of Bilston, and served the County Borough of Wolverhampton, the Borough of Smethwick, the Urban Districts of Amblecote, Bilston, Coseley, Darlaston, Heath Town, Oldbury, Rowley Regis, Sedgley, Short Heath, Tettenhall, Tipton, and Wednesfield, and the Rural District of Kingswinford, which districts were, by a provisional order made by the Local Government Board, under sect. 279 of the Public Health Act, 1875, formed into a united district.

The population of the area at the last census was 362,578, the ratable value 1,374,105*l.*, and the area 37,731 acres. A penny rate in the pound produced 5,725*l.*

The buildings afforded accommodation for forty patients, and for a sufficient staff of

nurses, etc., to look after a larger number of patients should an epidemic arise.

The building site was surrounded by an unclimbable galvanised iron fence 7 ft. high, and consisted of about 5 acres. The remainder of the site was fenced in with barbed-wire fence to keep the public from trespassing over it and approaching the hospital.

The administrative block provided accommodation for a resident doctor, matron, and fourteen nurses and servants. A large cooking kitchen, surgery, and store-rooms, and the necessary bathrooms and sanitary accommodation were also included in this block.

The hospital itself consists of three pavilions. Nos. 1 and 3 pavilions would accommodate sixteen patients each, and No. 2 pavilion, which was an observation block for doubtful cases, would accommodate eight persons.

Each of these pavilions was divided into two wards (male and female), with a nurses' kitchen separating them. Bathrooms and sanitary conveniences were also provided for each ward.

The three pavilions were connected to each other, and also to the administrative block, by covered ways so constructed as not to prevent the free passage of air on all sides of the buildings.

The buildings were erected in red brick, and were of the simplest character possible, without any attempt at ornament or decoration. They were erected on concrete bases interlaced with steel joists bolted together. The floors were of teak, and the walls, being faced with "Albino" cement, were perfectly smooth, and no mouldings or acute angles had been introduced. All the corners were rounded off so as to allow no possible resting-place for dirt or disease germs.

The buildings were lighted throughout by electricity, and the large pavilions were also wired for electric radiators.

The ventilation and heating were carried out by natural means. The windows opened in the "hopper" form at the top, and the sashes at the bottom could be continually open so as to allow a current of fresh air without causing draughts. The Moorwood hospital stoves drew in fresh, cold air, which, after passing through the stoves, entered the wards in a warmed condition.

A special feature had been made of the doors, which were composed of deal and compo-boarding, so framed together as to give a perfectly even surface on both faces without any mouldings or panels.

Exits are provided at the end of each ward in addition to the central entrances in case of fire or panic.

The drainage was treated upon the site, there being no main sewers within a considerable distance.

The grounds in the building area had been laid out in a simple manner with shrubs and trees, and about 30 acres of the remainder of the site had been planted with trees by the Midland Reafforesting Association. By this means it was hoped that the value of the property would be increased, and its appearance rendered more attractive.

The cost of the work, including the purchase of the land, was 18,000*l.*

The water supply to the township was derived from a well in the red sandstone situate at the Bratch, in the parish of Wombourne, about seven miles from Bilston. The level of the floor of the engine-house was 267 ft. above O.D., and from there the water was lifted a height of about 440 ft. from the level of the water in the well to the service reservoir, through some four miles of 14-in. main.

The average daily consumption during the four consecutive years ending March 31, 1902, was at the rate of 19·48 gallons per head of the population. The average for the four consecutive years ending March 31, 1907, was 16·75 gallons per head per day of the population.

LOAD TESTS OF A FERRO-CONCRETE FLOOR IN DUNDEE.

ON July 5 a series of tests was conducted under the direction of Messrs. Johnson & Baxter, architects, upon one of the floors in the new bonded warehouse erected for Messrs. James Watson & Co., Ltd., at Seagate, Dundee.

The new building was designed in accordance with the Mouchel-Hennebique system of ferro-concrete, and includes some structural features of unusually interesting character. It takes the place of the warehouse destroyed by fire in July, 1906, and every precaution was taken to guard against any repetition of the disaster. The warehouse includes five stories, covered with a flat roof, and occupies a site of about 27,000 sq. ft. It is divided into three entirely separate sections by fireproof division walls, through which the only means of intercommunication are provided by fire-locks. In addition to this novel structural feature, a very complete system of ferro-concrete ducts has been installed with the object of permitting the spirit to be drawn from any floor of the warehouse where an outbreak of fire may have occurred, thus facilitating the extinction of the flames by removing the inflammable material from their vicinity.

The floor area selected for the purpose of the official tests was situated on the ground floor, and measured 19 ft. 6 in. by 12 ft. 6 in. It is carried by one of the main beams, 8 in. wide by 6 in. deep, exclusive of the floor slab, which is 4½ in. thick. The floor construction, including main and secondary beams and a continuous floor slab, is of standard Mouchel-Hennebique design, having bent, longitudinal reinforcement to provide for continuous beam action, and transverse stirrups to withstand shearing stresses.

In compliance with the terms of the specification, the floor area was loaded to the extent of 3¾ cwt. per square foot, or 50 per cent. beyond the normal working load. For the measurement of deflection three sensitive instruments, giving readings in 500th parts of an inch, were placed beneath the beam, one in the middle of the span, and the others at the distance of 6 in. from the supports. In the following table we give the various deflections observed during the process of loading :—

Time.	Load in Cwt. per Sq. Ft.	Deflection of Decimals of an Inch.		
		Left-hand End.	Middle.	Right-hand End.
12 noon	0·00	0·000	0·000	0·000
—	1·64	0·004	0·036	0·012
1.0 p.m.	2·46*	0·016	0·080	0·024
2.15 p.m.	2·79	0·020	0·096	0·028
2.40 p.m.	3·77	0·040	0·164	0·044
3.40 p.m.	3·77	0·040	0·168	0·044
4.0 p.m.	3·77	0·040	0·168	0·044

* This load remained unaltered for one hour.

BRONZE STATUE, ST. JOHN'S HOUSE.

IN our issue of August 3, we illustrated the front of St. John's House, Queen-square, of which Mr. E. C. Frere is the architect, and which showed a statue of St. John in a niche in the middle of the front.

We now give an enlarged illustration of this statue, of which a separate photograph has been since sent to us by the sculptor, Mr. F. Lessore.

Bronze Statue of St. John, on Front of St. John's House, Queen-square. Mr. F. Lessore, Sculptor.

At 4 p.m. unloading was started, and at 9 a.m. on the succeeding morning, when the load had been entirely removed, the deflection registered was scarcely appreciable. By 12 noon of the same day the indicators of the three instruments all pointed to zero.

The maximum deflection of 0·168 is equivalent to $\frac{1}{1360}$ of the span, which compares very favourably with the proportion of $\frac{1}{600}$ permitted by the terms of the specification.

Other satisfactory points were that no surface cracks were developed in the concrete, and that the perfect elasticity of the construction was proved by the disappearance of deflection on removal of the loading.

Builders' and Contractors' Column.

NOTES ON ESTIMATING.—III.*

By A. C. Passmore.

The terms of payment on account of contract is of primary importance when it is remembered that wages alone form roughly 50 per cent. of a builder's turnover, and the clauses relating to the methods of payment should be carefully read when estimating in order to ascertain whether the builder's finances will allow him to undertake the work. Of course, he may be able to obtain overdrafts from his bankers, but it must be remembered that the "bank charges" will have to be deducted from the profits of the job, and hence his percentage of profit should be made to cover this, or his balance will be on the wrong side. One of the chief worries of a builder is in trying to get payment for his work at the proper time. He generally has to coax the architect for weeks to get him on the job to inspect the work and issue his certificate, and then the building owner frequently resorts to every known subterfuge to evade payment. The greatest contention always occurs as to payment of the balance. Terms of payment depend much upon the amount and the character of the work. The London School Board, in a contract over 600*l.*, extend the payment of the balance in three portions over seven months; but to make the same conditions for a 20,000*l.* job apply to a 600*l.* is absurd. At the risk of being adversely criticised, the writer maintains that a builder should be entitled to interest on all money kept in hand as "retention money" for any lengthy period. For a very long time it has been the custom to pay 80 per cent. on the value of the work executed and fixed in its place, but, considering the increased difficulties of building and the shorter credit now than formerly, the percentage of payment should be increased, and certificates for payment should be promptly given and promptly paid.

A similar clause to the following in a more or less modified form is, or should be, found in most specifications:—

"If the employers or building owner shall make default of paying any monies to which the contractors may have become entitled for seven days after the amount thereof shall have been certified, or if the whole of the works be delayed for five months by or under any proceedings taken by other parties, the contractors are to be at liberty to suspend the works executed and to require payment for all works executed and all materials wrought up, and for any loss which they may sustain upon any goods or materials purchased for the works; and in such case the contractors are not to be bound to proceed further with the works contracted for. The contractors are to be entitled to such interest, and at such rate, as the architects shall certify from all money payable to the contractors, payment of which may have been unduly withheld."

The method usually adopted for making payments for houses during erection is to make five payments on account at certain stages of the work, such as when one-quarter, one-half, and three-quarters of the work are completed. Usually, one-quarter, or 25 per cent., of the contract amount is paid when the first floor joists are laid; one-quarter when the roof is slated; one-quarter when the first coat of plaster is on the walls, and 15 per cent. (or about one-seventh) when the job is finished, the balance of 10 per cent. being paid at the end of the time stipulated in the conditions of contract.

The best method of measuring up work for a certificate for a payment on account is to do so from the summary page of the priced bill of quantities, which gives the total value of each trade. Building contracts usually provide that the builder shall be paid on the architect's certificate as to the progress of the works. If the giving of the certificate is made a condition precedent to payment, the builder cannot obtain payment until the certificate has been given, but if it is fraudulently withheld the builder may sue the building owner for the amount which he alleges to be due, and also sue the architect for damages.

It is usual to insert a clause to provide that all materials and plant brought on the site shall become the property of the building owner or landowner, in order that some security is obtainable for payments made in advance, and also to make some provision in case the builder should become bankrupt and to prevent the intrusion of his trustee upon the works, as delay might be caused by the uncertainty as to what he could claim. Materials built in upon the land form part of it and belong to the landowner. It is insufficient merely to give power of seizure upon a bankruptcy, for that does not prevail against the claim of the trustee.

The time clause is more honoured in the breach than in the observance, and it is seldom that the penalty is enforced, but the liability is by no means removed, and in any contract where there is any speciality specified or sub-contractor, the time or penalty clause becomes a source of anxiety.

A record of the variations from the contract can only be kept by a systematic visiting of the job, and consultations with the foreman at the time of such variations and keeping a detailed record of the same with all correspondence relating to such variations, as some of the work may be covered up at time of settlement, rendering it impossible to measure up afterwards, with the result that endless discussions take place as to their correctness. If day-sheets have to be kept it is imperative that they be signed daily or weekly as stipulated by the clerk of works or the surveyor, as to their correctness. By so doing much trouble and a good deal of suspicion will be saved all concerned, as there is always the impression that one is trying to "do" the other. Most building contracts provide that the architect shall be at liberty to order extras, and if the employer wishes to limit the powers of the architect in this respect, he should be careful to make an agreement with him to that effect before the work is commenced. It is always desirable that there should be a written agreement, and a letter to that effect is sufficient if it clearly sets out the terms of the architect's employment.

Extras upon a contract are a frequent source of dispute between all parties concerned, and architects sometimes lose their sense of justice in their desire to keep extras as low as possible, or out of the contract altogether; and builders often allow greed to blind common sense, and both parties are apt to lose their sense of proportion in the adjustment of a matter that requires delicate handling. Extras upon a contract may occur in various ways, and the term is sometimes used as meaning additional work or materials falling within the meaning of the contract, or they may occur through deviations from the original plans or through omissions from the quantities, or through unforeseen circumstances arising in connexion with the building or site; or the term may mean work or materials wholly outside and independent of the contract. Extras within the meaning of the contract are adjusted by the prices of similar work in the quantities, if the work is done while the contract is in progress. Those outside the contract are not governed by the terms of the contract, but are paid for at what is considered a fair value in the opinion of a jury or an arbitrator. Work done after a contract is completed must be looked upon as a fresh transaction. In measuring extras and omissions the builder is liable for the charges of the surveyor, the charges being usually added to the builder's account.

All authorised extras for which a price may not have been previously arranged, and which cannot be properly measured and valued, is generally executed at day-work prices. It is usual to stipulate that no extra work shall be performed without a written order signed by the architect, and a weekly statement of any extras is generally required by the architect.

The effect of design on construction, or, to put it more plainly, the instructions or methods which the architect or engineer compel the contractor to adopt as the work proceeds, generally incurs a loss to the contractor, because while the specification gives in a general sense the methods which will have to be adopted in executing the works, these may be modified as the work proceeds almost out of recognition by variations made, and these are covered by clauses in the specification giving the architect or engineer power to vary, increase, or decrease the work, whilst adhering to the prices originally tendered. These variations often make a difference of as much as 50 per cent., especially in cases where no detail drawings are supplied at the time of estimating, the work being charmingly described to be "to detail." Variations of contract have placed many a builder in the Bankruptcy Court. We could cite one case of bankruptcy in which the debtor attributed (and apparently proved) his failure to be the result of an elaboration of "detail." The extent to which the general directions of a specification are enforced depends so much upon the ideas of the architect that a job executed from the same specification under one man's supervision may cost half the amount of what it would under another man's supervision.

Circumstances vary in almost every case, and identical buildings may cost widely different sums in different localities. Even the cost of carting material, the facility of obtaining labour, and even the provision of water for the use of the works often make a very substantial difference in the cost of construction. Some goods can be bought so cheaply that one wonders how it can show any profit at all. An article is not necessarily cheap because it is sold at a low price. Unless it has the quality of durability it is dear even as a gift, and the same may be said as regards the execution of work. The first point to be considered is that of durability, as it is obvious that no matter how low the price it cannot be cheap unless it is constructed to stand the test of hard wear.

In order to estimate correctly it is necessary to fully analyse and take into account the various component parts of a cost, as frequently, besides labour and material, in some jobs the cost of the hire or use of scaffolding and plant is a very serious item; whilst in others, tarpaulins, temporary hoarding, watching, and lighting are very costly items. Again, cartage varies considerably on every job, and must always be well considered, and also railway rates; the use and re-sharpening and setting and repair of implements and tools; lighting and fuel and oil for engines, etc.; railway fares and lodging-money; the necessity and extra cost of overtime; providing water for the works; in the country this is often a serious matter. The items all affect the cost of individual jobs very considerably, and it is of primary importance that they should be carefully considered.

In pricing quantities "net" the use of double-cash ruled paper is advisable, and to price the labour, materials, etc., in separate columns. The latter can generally be calculated with some degree of certainty, but the labour part is generally very speculative and must be keenly watched, as the vital point of the balance between profit and loss. This method of pricing shows the analysis of each item, and makes it impossible for an estimator to hide his proceedings by mixing-up labour, material, and cost, and each stands on its own basis.

Some surveyors have a habit of making certain additions to provide against discrepancy which may have occurred in taking off. It is a well-known fact that builders constantly tendering on quantities of known surveyors get to know their habits and methods and can generally tender very close. Builders taking off their own quantities for the purpose of estimating do not go into so much detail as a quantity surveyor. They measure the work more fully to allow for omissions in the description of labour, as the liability to error in pricing an estimate is very considerable, and one explanation of

* Continued from page 292.

the wide difference between the lowest and the highest tender for buildings is that the lowest tender has some omissions or some mistake in calculation. As it is the practice for a builder to give his estimates free of any charge, he naturally spends as little time as possible in doing it, and so does not find out what is missing until the work proceeds and the items forgotten crop up and come home to roost. The clause, "the quantities have been prepared with care and accuracy as far as possible to obtain same, but the contractor must satisfy himself as to whether they are accurate or not before he signs the contract, as no claim will afterwards be considered if any error or omissions be found," is a vicious clause, and is of a kind that makes contractors dissatisfied and the building owner suspicious. Obviously, there is something wrong in such a clause which operates so unjustly. The question as to whether quantities should form part of the contract has been the subject of much discussion; their being so has been contended that it would make the surveyor careless as to whether his quantities were correct or not.

In Scotland it is the custom to re-measure the work on completion of the contract, and pay for the work at the original rates in the priced bill of quantities. Generally a priced set of quantities has to be left in the architect's hands for adjusting omissions or extras before a contract is started, but such quantities should be sealed, and remain so until the settlement of contract, otherwise it is quite possible for the architect to omit many things on which the contractor would obtain a big profit. The quantities should be carefully checked by the contractor before they are sealed to see that all the prices are correct and properly extended, and the cashing-up accurate. Even in estimating from bills of quantities there is a certain amount of speculation, as a contractor often finds as the work proceeds that through some error of judgment his rates are too low to give a reasonable profit; he may have forgotten to add cost of carriage, or miscalculated the amount of labour, or priced an item too low in comparison with its quantity of material and labour. Of course, estimating from a properly prepared bill of quantities reduces the risk of contracting to a minimum. It is found that no advantage is gained by measuring certain classes of work in much detail. A convenient base to work upon is adopted and used in practice. Although there is a present tendency in quantity surveying to go more into detail, it is found that too much detail is not unattended with evils, as with inexperienced contractors it is found to increase the amount of the tenders; differences in reading may make hundreds per cent. difference in the prices, and greed sometimes produces disastrous results.

Discounts are of two kinds, a "trade" discount and a "cash" discount. The former largely depends upon the status of the builder, or whether the merchant is anxious to secure the order; it varies considerably from 10 to 50 per cent., and in some cases even more. "Trade" discounts are not generally stated in the catalogues and price-lists issued by merchants, but can only be obtained on application, as the discount largely depends upon the quantity and the quality of the goods—the larger the order the larger the discount.

The "cash" discount is usually 2½ per cent. on accounts settled 10th of month following date of delivery, or 5 per cent. for cash before delivery of goods. Quarterly and overdue accounts are charged "net," and if very much overdue interest may be claimed. The prompt payment of accounts in order to procure every possible discount should be done whenever possible, as it becomes a source of profit. The subject of empty packages is one that can by no means be treated lightly by a builder, as the merchants charge most absurd prices for packages, totally out of proportion to their value, and even if the merchants allow for their return they are always a source of loss to the builder, as he has to pay carriage, and this should be noted in estimating for work. A knowledge of railway rates is necessary for an estimator, as, although goods are sometimes quoted "carriage paid," it frequently happens that it is more profitable for the buyer to pay carriage, as frequently merchants do not know the exact rates at time of quoting, and therefore in order to be on the safe side allow for a higher rate than is perhaps necessary. Much could be written on the subject of the tyranny of railway companies in the carriage of goods. There are two rates—one called company's risk, under which, presumably, the company is liable for damage, but which liability they try to evade by subterfuges which are a disgrace to any commercial body. A lower rate, called "owner's risk," under which the company is not liable in any shape or form, is a doubtful blessing. Rates differ with the class of goods and the different companies. They are much less in proportion for long distances than for short ones, and where goods have to travel over different companies' lines, or over private sidings, the rates are higher. In one case in the writer's experience, 7d. a ton was charged for a distance of about a mile. Articles go far more cheaply by goods trains, which are slower but by no means safer, than by ordinary passenger trains. In some cases the cost of hire of waggons must be included and added to the rates and cost of goods. The transport of goods by canal is cheaper than by rail, but the traffic has declined in proportion to the development of railways, and the general inability to receive barge loads of any one class of material, except in very large contracts where ample room for storage exists. The question of demurrage is often a serious matter, especially with what is known as foreign waggons—that is, waggons belonging to one company being delayed on another company's lines. Damaged goods if returned must be returned by same route as received labelled "Carriage Free—Damaged in Transit." Goods should be examined on receipt to ascertain if they are damaged; if this is not possible the delivery note should be signed "Contents not Examined."

The clause, "provide water for the whole of the works," does not usually present any obstacle to a contractor executing work in a district supplied by a water company, provided he ascertains their charges before sending in his tender, but as works are often executed in districts not so supplied, the means of providing clean water is often a source of worry and expense. Of course, water of some kind can be obtained in almost any district from wells, brooks, canals, or rivers, but some architects and engineers will not allow it to be used unless it is clean and free from organic matter.

One of the most speculative items in all contracts is the "dealing with water" found in the excavations, and it is one of those elusive items which the architect and engineer generally shirks by putting the risk and responsibility on the already over-burdened back of the contractor, and one generally finds that such items are subject to the usual restriction that the methods adopted must be to the satisfaction of the architect or the engineer.

The liability to error in pricing an estimate is considerable, and no opportunity should be lost to check an estimate in every possible way to see that the prices have been extended, the casts correct, etc. When quantities are supplied it is usual for the accepted tenderer to deposit a copy of his quantities fully priced out with the architect, for the purpose of adjusting any extras or omissions that may occur. It is often contended that the deposited priced bill of quantities should remain sealed until the completion of the contract, as in some cases in which this has not been done the architect has omitted from the contract many things on which the builder would have obtained the largest profit. The great difference in the amounts of tenders between the highest and the lowest is often a matter of comment, and it may generally be concluded that an error has been made, and a contractor who is absurdly low in his tender should be given the opportunity of withdrawing it; to force a man to undertake a contract at an absurd price should be made a criminal act. Of course, after the contract is signed no allowance for errors should be allowed, but the contractor should be given every opportunity of checking his tender and comparing the total with the totals of the other tenders before signing the contract. If he withdraws his tender then, the next lowest tender should be accepted. The following is the chief cause of error and inaccuracies in estimates:—(1) Items neither priced nor extended; (2) items of feet priced at the rate of a yard and *vice versâ*; (3) items lumped; (4) difficult items of work priced at the same or a less rate than simple work; (5) items of small quantity priced at the same rate as for a large quantity; (6) items extended without a rate attached; (7) pricing items at (or less than) cost price, and without allowing for labour, fixing, etc.; (8) neglecting to obtain current prices; (9) disregard for difficulties of site, locality, etc.; (10) disregard for the fluctuation of the market; (11) insufficient knowledge of the value of work and its difficulties; (12) disregarding the time of the year; (13) mistakes in working out cost of items and in casting-up totals; (14) allowing too much credit for old materials. The probabilities of error are so numerous as to make their enumeration almost impossible.

In estimating from quantities the headings of each "bill" should be carefully read, as, although they only generally describe the materials, they often contain items that require pricing, and notes that affect the prices of the items in the "bill," and a faulty estimate may mean a heavy loss either financially or socially.

The approximate value or percentage of each trade to the total of the estimated cost of work may be approximately calculated by multiplying the total of the estimate by the constants given in the following table, which is for ordinary work only. Difficult work, or that with any elaborate detail, or where one trade is greatly in excess of the other than usually, the constants must, of course, vary according to materials and class of work, and also for very small jobs, or those less than 1,000*l.*

Excavator	·005	Gasfitter	·010
Drains	·010	Paperhanger	·009
Concrete	·013	(Electric)	·007
Brickwork	·205	Glazier	·009
Boundary walls	·059	Painter	·027
Masonry	·014	Bellhanger	·007
Slater	·046	Laying out ground roughly	·004
Tiler (roof)	·046	Levelling site	·004
Tiler (floor)	·019	Depreciation of plant	·004
Carpenter	·086	Sundries	
Joiner	·286	Insurance	·009
Ironmonger	·014	Expenses	
Smith and founder	·045	Water, etc.	
Plasterer	·058		
Plumber	·068		

RAILWAY COMPANIES AND HOUSING IN KENSINGTON.

DR. T. ORME DUDFIELD, Medical Officer of Health for Kensington, in his annual report just issued says that a scheme was initiated last year under powers conferred on the Great Western Railway Company by their Additional Powers Act, 1897, which enables the company to acquire houses in certain streets at North Kensington for the purpose of widening their line. The houses proposed to be acquired under the scheme were ninety-five in number (sixty in Worningtonroad, eleven in Admiral-terrace, fifteen in Admiral-place, nine in Admiral-mews), and tenanted by about 1,150 persons, mostly of the "labouring class." The company acquired land in the vicinity with a view to compliance with their statutory obligation to provide new dwellings for such a number of persons as the Local Government Board should, after inquiry, deem necessary, "having regard to the number of persons on or after" December 15, 1896, residing in the houses to be acquired, "and working within one mile therefrom and to the amount of vacant suitable accommodation in the immediate neighbourhood of such houses, or to the place of employment of such persons, and to all the circumstances of the case." The Act requires that "the new dwellings to be provided under the scheme" shall be "completed fit for occupation before the persons residing in the houses . . . are displaced." Sub-sect. 15 reads as follows: "For the purposes of this section the expression 'labouring class' means and includes mechanics, artisans, labourers, and others working for wages, hawkers, costermongers, persons not working for wages but working at some trade or handicraft without employing others, except members of their own family, and persons other than domestic servants, whose income does not exceed an average of thirty shillings a week, and the families of any such persons who may be residing with them." The local inquiry necessarily precedent to sanction to a scheme for providing new dwellings for the number of persons displaced and entitled to be rehoused, was held at the Town Hall on February 6 by an engineering inspector of the Local Government Board, the Council, the County Council, and the Railway Company being represented thereat, and a considerable number of inhabitants interested—as owners or tenants of the houses—being present. It was agreed that substantially there was no

"vacant suitable accommodation in the immediate neighbourhood" of the streets named for the persons to be displaced. The company submitted plans of the proposed new dwellings showing accommodation for 670 persons in tenements of two, three, and four rooms, two persons to a room, the number of rooms being 335. They admitted liability to provide for 600 persons, and denied liability to provide for other 394. The population was assumed to be 944, but it was agreed that to this number forty-four should be added in respect of persons no longer resident in the streets, being rather less than a moiety of those who on December 15, 1896, resided in houses since acquired by the company and now empty, thus raising the population to 1,038. The company's building scheme provided a margin of accommodation for seventy persons in thirty-five rooms for any number of persons beyond 600 the Board should require to be rehoused. At a conference held subsequent to the public inquiry between the company's officials and the officials of the Council, liability to provide for about eighty persons additional was admitted, and at a further conference between the Inspector and the official representatives of the Council and the company, this number was agreed. It may be interesting to mention classes of cases which gave rise to divergences of opinion, some of which were settled, others being reserved for the decision of the Local Government Board. 1. The company claimed to exclude from the scheme a number of minors of both sexes earning small weekly wages. It was contended on behalf of the Council that the said persons were not "independent," their earnings being insufficient to keep them; they, moreover, residing with their families and the fathers in several cases working within one mile of the houses. Most of these persons were retained in the scheme. 2. The company claimed to exclude married women employed as laundresses, charwomen, etc., "within one mile" from their homes on the ground that they must follow their husbands who are employed without the mile, and are the tenants of the rooms occupied by the family. Dissent from this view was expressed, it being contended that as bona-fide workers "within one mile" and "having regard . . . to all the circumstances of the case," these women were entitled to be provided for, and their families. In more than one such case the father was unemployed, and children were employed "within one mile" of the house. 3. Some of the company's servants who with their families reside in the streets were excluded, the "place of employment" stated to be the goods station at Paddington not being "within one mile" of their homes. For the Council it was contended that "having regard . . . to all the circumstances of the case" these persons should be provided for. It was proved that several of this class of persons proposed to be excluded worked "within one mile" of the houses where they live, and these were admitted to the benefits of the scheme. 4. The company claimed to exclude a number of old inhabitants admittedly not "working within one mile" of their homes. It was contended for the Council that "having regard . . . to all the circumstances of the case," provision should be made for such persons. For the Council it was contended that accommodation should be provided for 749 persons, or at least for 705 out of the 1,038 displaced, and the Board ultimately informed the company that they were of opinion that accommodation should be provided for 706. The Board, moreover, required certain modifications in the plans, the carrying out of which will tend to improve the scheme materially. It is to be regretted that in any case not far short of 300 persons displaced will not be rehoused in the new dwellings. It is a serious matter for the persons concerned, and there may be worse to follow, for under the "Great Western Railway Act, 1900," a further scheme has been framed providing for the acquisition at some future time of 128 houses (seventy-eight in Southam-street, and fifty in St. Ervan's-road), the population of which in 1901 was over 2,000. Should these houses be demolished and the resultant displacement of persons, for whom the company will not be required to provide new dwellings, be on the same scale, it is probable that the two Acts will have the effect of displacing without rehousing 1,000 persons, including old inhabitants and persons earning a livelihood for themselves and, wholly or in part, for their families, but not working "within one mile" of their homes. The Council have expended many thousands of pounds in providing housing accommodation in another part of North Kensington for less than a half of the number of persons who will have to leave the neighbourhood of their present homes, or remain to overcrowd it on being displaced by these schemes for providing new dwellings for persons of the labouring class.

BAPTIST CHAPEL, TOOTING.—A new Baptist chapel is to be built at Tooting. Plans have been prepared by Messrs. Wills, of Derby, for a building which will seat some 800. The total cost, including the site, will be about 6,400*l*.

Illustrations.

WINDOW IN PUBLIC BUILDING.

THIS illustration is from the original coloured sketch (exhibited in the Royal Academy) designed for one of the staircase windows at the United Kingdom Provident Institution in the Strand.

The subject, "Lux Veritatis," is represented by a female figure holding aloft a torch flame and carrying a vessel of oil, and supported by winged figures with emblems and the Royal arms. The group is massed in a strong scheme of rich colours, and has a light background representing an architectural elevation of a temple, upon which is shown a sculptured subject of the "Five Wise and Five Foolish Virgins."

This coloured scheme is designed to harmonise with the surroundings of Cippolino marble and bronze enrichments.

J. DUDLEY FORSYTH.

THE MANCHESTER STOCK EXCHANGE BUILDINGS.

THESE buildings occupy a central site in the business part of the city, and are surrounded by streets on every side. They are four stories in height, and include, besides the Stock Exchange, a bank and various suites of offices. Consideration for neighbouring "ancient lights" has necessarily influenced the design to some extent, both in planning and in elevation.

The exterior walls are faced with granite to the level of the first floor, and with Portland stone above. The main entrance to the Stock Exchange is at the upper end of Norfolk-street, and a second entrance for clerks (on the right of the plan) is provided from Pall Mall. The "house" is situated on the ground floor at the rear of the building, and has a clear floor space of 78 ft. by 49 ft. It is a domed hall, well lighted from the top and sides, and is 41 ft. high to the centre. The walls of the "house" and staircases, etc., are lined with marble. Reading and smoke rooms are provided for members, with reception cabinets for consultations. On the lower ground floor beneath the hall are the clearing-house, the clerks' rooms, and telegraph operators' rooms, as well as accommodation for messengers. The secretary's suite of offices is on the first floor, with the board-room and ante-room.

The building is fireproof throughout, and is specially planned to meet any emergency in case of fire, with double staircases, emergency corridors, etc. The heating and ventilation of the building are dealt with in a combined system, filtered fresh air, warmed or cooled as required, being distributed throughout under pressure, and open fireplaces are provided in all parts.

The buildings have been designed and carried out by Messrs. Bradshaw & Gass, with whom is associated Mr. A. J. Hope, of Bolton and London. The builders were Messrs. Wm. Brown & Sons, of Salford.

ENTRANCE TO BROOKLANDWOOD HOUSE, BALTIMORE, U.S.A.

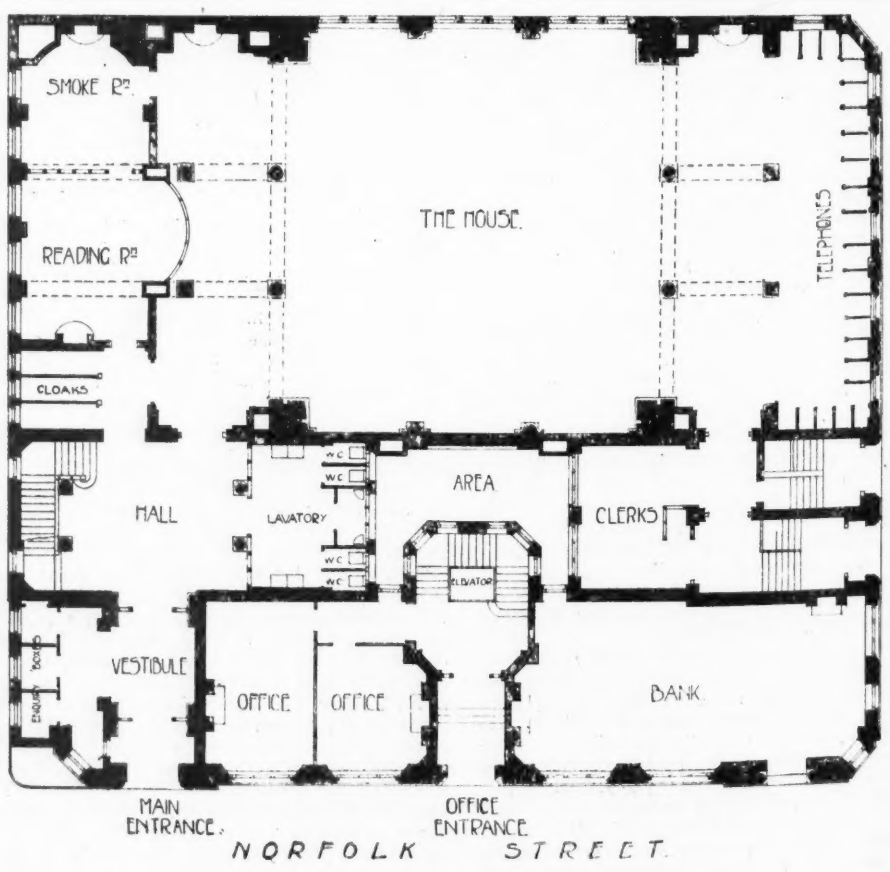
THE lodges and entrance shown in this drawing, which was exhibited at the Royal Academy this year, are now erected on the estate of Mr. H. Carroll Brown, of Brooklandwood, Brooklandville, near Baltimore, and terminate an avenue of scarlet oak and hickory, which has been opened up in connexion with an extensive garden scheme on this (the north) side of the house.

The lodges are in full view of the house, and the drive, central with the *porte cochère*, terminates in a spacious carriage court. The lodges are occupied by the head and second gardeners, being close to the kitchen-garden and the range of glass. To atone in some measure for the desirable fringe of green grass, we have planted a low, wide hedge of box-trees alongside the drive on both sides, which is to be neatly trimmed to a height of 2 ft.

The lodges are built of the small local 8 in. by 2 in. bricks, which, like the mansion and most other buildings on the estate, are afterwards painted white.

THOS. H. MAWSON.

COUNCIL SCHOOLS, SOUTHEND.—New Council Schools have been erected in Bournemouth Park-road, Southend. The schools are built on the central hall system. In the "mixed" department there are four class-rooms each for sixty children, three for fifty, and one for forty; and in the infants' school there are four for sixty and four for fifty. Messrs. Greenhalgh & Brockbank, Southend, were the architects, and Messrs. Hammond & Son, Romford, the builders.



GROUND FLOOR PLAN.

SCALE OF FEET

The New Stock Exchange, Manchester.

Competition.

RADCLIFFE TOWN HALL.—The Radcliffe District Council has decided to give the architect who presents the best design for the new town hall 150*l.* if he is not appointed to carry out the work, and 75*l.*, 50*l.*, and 25*l.* for the second, third, and fourth prizes. The competition is to be restricted to architects practising and having offices in Lancashire.—*Manchester Courier.*

Books.

The Petit Trianon, Versailles; Illustrated by Drawings and Photographs. By JAMES A. ARNOTT and JOHN WILSON, architects. Part I. (London: B. T. Batsford; 1907. Price 21s.)

THIS is the first part of a folio publication to be completed in three parts. The first thing which strikes us, we regret to say, in the publication, is that while describing the building "as a complete example of French architecture of the best period of the XVIIIth century," and therefore a typical building specially worthy of study, the authors entirely omit the name of the eminent architcet, Gabriel, who designed it. In amateur disquisitions on architecture one expects this; but on the part of two architect authors we call it an extraordinary and not very creditable omission. Jacques Ange Gabriel, who was one of the greatest French architects of his day, represented the third generation in a family of architects. His grandfather, architect of the Château of Choisy-sur-Seine (destroyed at the Revolution), held for many years the title of Royal Architect, and married a niece of F. Mansart. The second Gabriel (also Jacques), was a pupil of Hardouin Mansart, and also held the post of Royal Architect, and carried out an immense number of buildings. His son, Jacques Ange, born in 1699, who was perhaps the most accomplished of the three, at all events the one of whose work we know most, carried out the Ecole Militaire (which is now fortunately to be thrown open to view again from the Champ de Mars by the removal of the Galerie des Machines), the fine buildings at the top of the Place de la Concorde, and the Petit Trianon, which was devised by the king as a special gift to Marie Antoinette, for which the leading architect of the day was selected, who certainly admirably carried out his task. Square and formal as the small palace is, it is externally a model of classic refinement of detail, and internally the delicacy and elaboration of the mouldings and carved ornament are beyond praise. The building must be taken, of course, in conjunction with the elaborately laid-out formal garden in front, which is all part of the design, including the curiously planned and fanciful music pavilion, with its four bays making a cross of the plan, which stands in the wider space near the further end of the garden. A melancholy hangs over the place now; one cannot forget the tragic history of the lady for whom it was built as a plaything; and the contrast between what one can imagine of its former gaiety, and its empty condition now, a public show-place in the care of uniformed custodians on the look out for gratuities, is rather painful to the mind of the visitor.

This does not affect the architecture, however, which is there untouched and of course more accessible for the architectural student than when it was a scene of royal amusements. The authors have undertaken its illustration in the most thorough fashion, by measured plans and line elevations, large drawings of details, sections of mouldings, and photographs showing the actual appearance of the building in connexion with the formal garden and the long heavy masses of clipped trees flanking it. The photographs were necessary to the full elucidation of the subject, for no geometrical drawings could give an idea of the real charm of the sober-looking classic mansion seen as it appears at the end of the perspective of lawns and parterres and lines of squared foliage. The garden is not, any more than the great one at Versailles, kept up as it should be, but it still conveys something of the old appearance of the place.

The château is almost exactly a square on plan, three of the sides with a slightly projecting centre; on the west front, facing the garden, this is decorated by four Corinthian columns, echoed by pilasters of the same order on the north and south façades, where the projection is less. It is the most formal possible of formal classic architecture, and depends for its effect not so much on originality of idea as on finish and refinement of detail. The interior details are very fully shown, both by measured drawings and photographs. The delicate and lovely decorations of the doors and other portions of the Salon are well shown, though they must be seen to be realised; if royalty was a curse to the people in those days, it was at all events a blessing to the artists and artificers.

We may thank the authors for what is a very thorough and conscientious illustration (as far as it has gone in this "Part") of a building as interesting for its historic associations as for its artistic refinement.

The High-Road of Empire: Water and Pen-and-ink Sketches in India. By A. H. HALLAM MURRAY. (London: John Murray.)

THIS is a book on somewhat the same lines as the author's previous work "On the Old Road to Florence"; consisting of written impressions of the sites and cities visited, with many beautifully reproduced water-colour drawings supplemented by a great number of smaller sketches in pen line.

Its chief interest to us lies in the illustrations, which, as in the former book referred to, are of the highest character, and include not only architecture, which Mr. Murray treats admirably, but landscape effects; one of the cleverest being a study of sea entitled "The Wake of a P. and O.," the original of which we fancy we have seen in some exhibition not long since.

In dwelling on the excellence of the illustrations, however, as the feature in the book which comes most into our province, we must not be supposed to underrate its literary merit, which is also of a high order; and which, in view of its subject, should appeal to all Englishmen who realise what a great chapter in England's history has been her conquest and administration of India. The author says in his preface that his object in the book was not only to awaken pleasant memories in those who had already fallen under the spell of India, but also "to awaken, if possible, in the minds of others the determination to become better acquainted with the great Empire in the East, the guardianship and protection of which is at once our pride and our duty. The appeal which India makes to us is as many-sided as it is universal and irresistible, with its glorious architecture, its unique landscapes, its rich historic associations, and above all its strangely interesting people, whose customs and character have come down unaltered through the centuries, and are now submitted to the impact of new ideas and new conditions, to them doubtless in great part incomprehensible." Words with which we are entirely in sympathy, and which it is very much to the point to quote at the present juncture.

Among the passages in the book which give a vivid idea of Indian scenes is that on what the author calls "the extraordinary strangeness and beauty of the streets in the native town" at Bombay. "It is in a queer, gaudy way, the most wonderfully picturesque place it is possible to imagine, and, I believe, one of the best bits of Oriental town to be seen in India. . . . It would be well worth coming to India to see this part of Bombay. Indeed, it is in colour, sound, and smell—that characteristic and unmistakable smell of ghee, spices, and wood-smoke—an epitome of Indian life. The architecture is a *bizarre* mixture of Portuguese-Renaissance and Hindu, and some of the tall houses with their elaborately carved façades and projecting upper stories are remarkably good as works of art."

The Taj is described with the enthusiasm which every first sight of it must occasion, with a half apology for praising afresh what has been so often praised before. The Jumma Musjid at Delhi is also done full justice to, not only as to its architecture but as to the solemn effect produced by the combined worship of a great Mohammedan congregation, when the great crowd rises and falls, bows or kneels or stands, simultaneously. The thrilling effect of these unanimous movements of worship suggested to the author the strength of the undercurrent of faith which controls the sixty million Mohammedans of India, "and might, in any crisis, sweep them along, with incalculable force, in the most unforeseen direction"; a reflection to be borne in mind by those who have the rule of India in their hands.

Mr. Murray's book ought to do something to fulfil the aim expressed in the preface, for it is full of information given with pen and pencil; a pencil always facile and successful, and a pen that is never dull; it is a most readable book throughout.

The City of St. Alban. By C. H. ASHDOWN, F.R.G.S. 1s. *Bury St. Edmunds.* By W. A. DUTT. 6d. *Torquay: A Handbook.* By PERCIVAL H. W. ALMY. (London: The Homeland Association. 1907.)

THESE are three of the exceedingly useful "Homeland Handbooks" of which several have been noticed in our columns before. Besides the descriptive matter and illustrations of buildings and of special sites, they are all provided with maps of the districts surrounding the towns dealt with.

The book on Torquay, which is a mere watering-place, though with some modern historical interest connected with it, is naturally lighter and less important than the other two, which treat of places that are important centres of archæological interest. For small hand-books of this kind, both are well done and well illustrated; though Mr. Ashdown, who we see is Hon. Secretary of the St. Albans and Herts Archæological Society, either does not seem alive to the architectural mischief wrought by Lord Grimthorpe at the Abbey, and the totally improper circumstances of his appointment as restoring architect, or else he has his own reasons for being silent on the subject. Perhaps local influence was too great.

In the hand-book on Bury St. Edmunds a plan of the town is given, as well as the district plan; and among the illustrations is a plate from a drawing by Mr. W. K. Hardy, showing a bird's-eye view of "The Abbey as it appeared before the Reformation"; but as far as we have noticed no authority is given for the restoration. A curious illustration (date 1734) is reproduced of the old wooden theatre, which appears to have stood on story-posts with an open space beneath, possibly used as the market, as in many old town halls in small country towns. The frontispiece is a very pretty drawing of the beautiful bit of XIVth century work locally known as the Abbot's Bridge.

Electric Light and Power. By E. E. BROOKS, B.Sc., and W. H. N. JAMES, A.M.I.E.E. (London: Methuen & Co. 1907.)

TO JUNIOR students of electrical engineering this book will prove useful. The authors write with deliberation, and we have found very little to criticise in the book, and a great deal that is worthy of commendation. The demands made on the student's previous knowledge are of the slightest, and yet, if he reads the book carefully he will have a sound foundation on which to build his mathematical theories when it becomes necessary to study the subject in detail.

The book discusses modern apparatus and methods, and so, even electricians will find some of the descriptions helpful. The new types of metallic filament lamps are described at length, and so, also, are the "flame arc" lamps, which are now so well known in London. The elementary principles of dynamo construction and of power distribution are clearly enunciated, and the authors are laudably careful not to introduce descriptions of methods of doubtful utility or effects, the causes of which can only be understood by those who have had an extensive mathematical training.

We are sorry that the authors keep the science of "Electrostatics" so much in the background. The pressures used in "electric light and power" are now so high that electrostatic phenomena are familiar to all workers in this field, and we think that descriptions of brush and coronal discharges, tables of sparking distances, etc., would improve the usefulness of the book.

The diagrams are worthy of special praise, as they are all carefully drawn, and illustrate well the elementary principles involved.

The examination papers at the end of the volume were set by the City and Guilds of London Institute in the preliminary grade examination in electric lighting and power distribution. A study of them will assist the student to test the knowledge he has acquired by reading the book, and the useful index given will enable him to find the answers without the help of a teacher.

Roofing with the Iron Square. By LAURENCE TONGE. (London: The Chichester Press.)

THE object of this little book or pamphlet is to explain simple methods by which the iron or steel square may be applied to enable the carpenter to cut every timber member for a roof of any pitch or plan to its correct length and bevel without mathematical calculations or the use of drawing instruments. The directions given are written in very plain language, and, where necessary, are illustrated by figured drawings of equally satisfactory character. As the book is intended to be simply a practical guide, the author does not trace the development of his methods from the geometrical principles underlying them, but the omission will probably be considered an advantage rather than otherwise by roof carpenters.

BOOKS RECEIVED.

CATHEDRALS AND CHURCHES OF NORTHERN ITALY. By T. Francis Bumpus. (T. Werner Laurie. 16s.)

APPLIED MECHANICS.—By. John Perry, M.E., D.Sc. (Cassell & Co. 7s. 6d.)

BRITISH RAINFALL, 1906. By Hugh Robert Mill. (Edward Stanford. 10s.)

Correspondence.

THE STREET BRIDGE PROPOSAL.

SIR,—With reference to Mr. Collcutt's project for street bridges, I beg to suggest that the objection of those who are opposed to such bridges would be overcome by forming a pathway on the river side of the buildings on the bridge, which pathways might be covered or open, and with or without a balustrade. The effect from the river would probably not be improved by such an addition to Mr. Collcutt's design, but from the embankments it is not too much to hope that in his hands it might be an improvement. Many people would willingly sacrifice the pleasure of an open bridge in the summer for the comfort of a street bridge in the winter.

Opinions vary with circumstances; the question would probably receive a different verdict when the temperature is at 20 deg. with half a gale, than when it is 80 deg. on a sultry day.

FREDERICK ELLIFF.

The Student's Column.

MODERN METHODS OF USING GAS.—XI.

Radiators.

DIFFERENT FORMS OF RADIATOR.—The term "radiator" is commonly applied to an apparatus consisting of a number of vertical tubes or cylinders which are heated by hot gases, hot water, or steam, and which in turn warm the air surrounding them. In each case the source of heat may be a gas flame or a number of gas flames. The radiators are principally used for warming passages, halls, shops, and other places where the air is being constantly changed owing to the opening of doors which communicate with the open air, and they are not, as a rule, connected to a flue.

Gas Radiators.—In these the products of combustion are led through a number of metal tubes which become hot and heat the air surrounding them. A simple form of gas radiator, or condensing stove, consists of an Argand burner fitted with a glass chimney and connected to a sinuous metal flue of considerable length. The gas burns with a luminous flame, and the products of combustion escape from the top of the chimney into a metal pipe which bends downwards and upwards until the products of combustion have been cooled almost to atmospheric temperature. The water vapour resulting from the combustion of the hydrogen in the gas is condensed to water, and is collected in a suitable vessel. About 1 pint of water is produced by the combustion of 20 cubic ft. of coal gas, and most of this is condensed in a radiator or condensing stove. The Argand burner and condensing tube are enclosed in an ornamental metal case. The uncondensable products of combustion, after parting with their heat, escape into the air. Removal of products of combustion when cold would be more difficult than when they are highly heated, because the cooled products are heavier than air and would not, therefore, flow up a chimney unless there happened to be a strong up-draught within it.

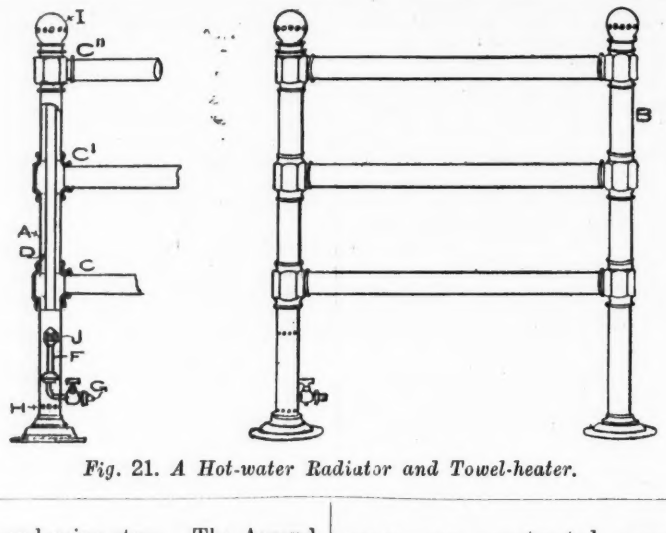


Fig. 21. A Hot-water Radiator and Towel-heater.

One modern form of gas radiator consists of an open ball fire with radiators on each side of it. The products of combustion from the ball fire are led into the radiating tubes, which condense the water and heat the surrounding air. There is greater liability of incomplete combustion of the gas occurring with radiators in which the gas flame comes in contact with a solid material than with radiators having flames which do not come in contact with any solid substance.

Hot-water Radiators.—In hot-water radiators a number of tubes filled with water are heated by one or more gas flames. Provision has to be made for the expansion of the water under the influence of heat, and the water should not be heated to boiling point. As an example of a hot-water radiator which will warm a bathroom and may be used for drying towels, an illustration (Fig. 21) is given of Ewart's radiator and towel-heater. The horizontal tubes C, C^1, C^{11} connect the annular vertical boiler A with the expansion-chamber B. The boiler A is heated by the burner F, which is supplied with gas through pipe G. The products of combustion flow up flue D, and escape through cap I. Any steam which may form in the boiler can pass through a small vent in the top of the vertical boiler, and escape with the products of combustion through cap I. The burner can be lighted through hole J, and air is admitted to burner through holes H. The vertical boiler and horizontal tubes are filled with water by pouring water into expansion-tube B. When the gas is lighted the water rapidly becomes hot owing to the small contents of the boiler. The hot water rises to the top of the boiler, flows through the upper horizontal tubes, down through the vertical tube B, and back to the boiler through the lowest horizontal tube or tubes. Constant circulation is thus ensured. Hot-water radiators of the size required for warming dwelling-

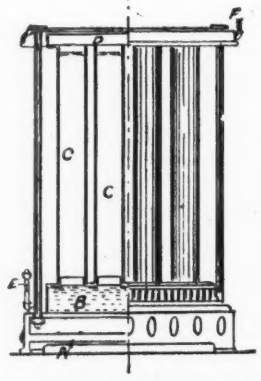


Fig. 22. A Gas-Steam Radiator.

rooms are constructed upon the same principle.

Steam Radiators.—In gas-steam radiators a small boiler is situated beneath the vertical tubes. A gas flame beneath the boiler heats the water to boiling point, and the steam generated fills the vertical tubes. In some forms of radiator when the pressure of the steam reaches a certain point it causes the gas valve to partially close, and the gas consumption is thus maintained at the most suitable rate. Some form of safety valve should be provided. As an example of a gas-steam radiator an illustration (Fig. 22) is given of a radiator patented by J. M. Swan. A gas burner A is situated beneath the boiler B. The boiler is connected to the vertical tubes C and the upper chamber D. A water-gauge E, and safety valve F, are provided.

General Building News.

BAPTIST CHURCH, MAIDSTONE.—On the 12th inst. the new Baptist Church in Knightrider-street was opened. The church is of Kentish ragstone, the style being Gothic. Joined externally by a lobby extending along the whole of the front are two vestibules, the western vestibule being carried up to form the dwarf tower, where there is a staircase leading to a small gallery over the lobby. On the ground there is a centre area with side aisles, arcaded with pillars of Doulting stone. The aisles, which are roofed at a lower level than the main body or nave of the church, form a clearstory. At the north end of the building is a slightly raised platform with pulpit and reading desk, and to the rear of this the baptistry, built of glazed brickwork with marble coping. The organ chamber occupies a transept on the east side. There are vestries at the north end for the minister and deacons, and a separate entrance for the choir. The church is lighted by mullioned and traceried windows filled with leaded lights in the cathedral tints. The lighting is by gas, and gas steam radiators will afford heat to the building. The builders were Messrs. Wallis & Sons, and the architect Mr. A. W. Smith.

NEW CHURCH, WOLVERHAMPTON.—Work has been begun on the erection of a new church in Hilton-street, Springfields. The building when completed will accommodate 600 persons, and the cost will be 6,000*l.* The architect is Mr. F. T. Beck, and the builders are Messrs. H. Willcock & Co.

CHURCH ENLARGEMENT, FINCHLEY.—The North Finchley Baptist Church is to be enlarged. The plans of Mr. Whiting, of Bedford-row, W.C., have been accepted for the enlargement, and when the scheme has been carried out there will be seating capacity for 680.

CHURCH HALL, BRISTOL.—A new hall is being erected in connexion with the Church of St. Michael and All Angels, at Bishopston. The building will be constructed throughout of stone. The hall will be 72 ft. long by 35 ft. broad, with a height of about 30 ft. It will be provided with a stage and a gallery. In addition, there will be three classrooms, cellarage, and the usual offices. The plans have been prepared by Mr. Harold Smith, architect, Bristol, and Messrs. C. A. Haves & Sons' contract of 2,377*l.* was accepted.

WESLEYAN CHAPEL, ARMLEY.—The new Wesleyan Chapel, which has been erected in Wesley-road, Armley, Leeds, was opened on the 14th inst. The church is Gothic in style, with tower and spire rising to a height of 106 ft. Accommodation is provided for 760 worshippers, the church consisting of a nave and transepts. At present there is no chancel, but when the scheme is completed this will be added as a recess for the organ and choir. The roof—an open one—is of varnished pitch pine, and the windows are

filled with leaded lights. The rostrum is of polished pitch pine. The architects were Messrs. W. J. Morley & Son, of Bradford. The estimated cost of the church is 6,000*l.*

SCHOOL FOR MENTALLY DEFECTIVE CHILDREN, HIGHFIELD, SHEFFIELD.—A new school for children mentally defective has been erected by the Sheffield Education Committee at Highfield. The building stands on a site in Sharrow-lane and Sitwell-road, the entrances for the handicraft and cookery departments facing Sharrow-lane, and the two for the defective boys' and girls' departments Sitwell-road. The four classrooms average 20 ft. square, each being arranged to accommodate twenty children. There is a marching-hall, 35 ft. 6 in. by 16 ft., in which exercises will be taught. There are also teachers' rooms on the ground floor and a kitchen. The rooms on the first floor are utilised as cookery and handicraft centres, each department being arranged for upwards of fifty scholars. The handicraft centre has, in addition, a wood store and cupboards for the scholars to keep their work in. Each department has a separate staircase, hat and cloak-room, and lavatories. The feature of the cookery department is the provision of a living-room and bedroom, fitted up and furnished, so that the girls can there be taught household and other domestic work. The classrooms, marching hall, and handicraft centre have wood block floors laid on cement concrete. The plaster work throughout has been decorated with pale salmon tint distemper. The buildings externally have been faced with rockies and ashlar stone from Stoke Hall quarries, black Westmorland slates being used for the roofs, and pitch-pine, varnished, for the internal joiners' work. Separate playgrounds for the boys and girls are provided, covered with asphalte, and each has covered playsheds. The schools are heated by means of a low-pressure hot-water system, fitted by Messrs. Sheen & Wells, of Sheffield, the vitiated air being conveyed from the rooms by ventilating tubes to extraction turrets on the roofs. The erection of the school has been carried out by Messrs. H. Brumby & Son, of Sheffield, the wrought ironwork for the railings and gates being worked by Messrs. Wilks Bros. & Co., and the asphalting by Messrs. Hadfield. The building has been erected from the designs and under the superintendence of Mr. A. F. Watson, architect, Sheffield, with Mr. C. F. Ripley as clerk of works.

COUNCIL SCHOOL, SOUTHALL.—A new secondary school has been erected by the Middlesex County Council at Southall. The main building comprises a large central hall, a dining-room, chemical and physical laboratories, preparation and art rooms, classroom for the accommodation of 270 students, principal's and other minor departments. A separate block is devoted to the manual training and cookery centres. The buildings are faced with red bricks and Monk's Park stone dressings. The work was carried out under the supervision of Mr. H. G. Grothall, the Education Committee's architect, at a cost of 11,125*l.*

COUNCIL SCHOOL, OVERSEAL.—A new Council School has been erected on a site in Woodville-road at a cost of about 5,000*l.* The school, with an infant department, has been erected to accommodate about three hundred and twenty children, and comprises a central hall surrounded with six classrooms. Mr. H. H. Simpson, of Leicester and Ashby, was the architect, and the builders were Messrs. Warren Brothers, of Mickleover. The painting and decorations have been carried out by Messrs. Holmes Brothers, Burton.

WESLEYAN SUNDAY-SCHOOL, HUDDERSFIELD.—The memorial stones were recently laid of a new Sunday-school which is being built in connexion with the Wesleyan Church at Gledholt, Huddersfield. The ground-floor room of the building will seat an audience of 300, and there will be a gallery for seating over 200. There are classrooms to accommodate 460 scholars. The total cost of the building is estimated at 5,500*l.*, and it will be constructed from the designs prepared by Mr. W. Cooper, architect, Huddersfield.

ELEMENTARY SCHOOL, SYKEHOUSE, YORKSHIRE.—A new public elementary school is being erected by the West Riding County Council in this village. The new building, which when completed will provide accommodation for 150 children, is being constructed in accordance with plans prepared by Mr. Vickers Edwards, the County Architect. The structure will be of brick, with red pressed facings, and red tiled roof. Three classrooms, each capable of accommodating fifty scholars, will be provided, and also cloak-rooms for teachers and children. The contract has been let to Messrs. Kelsey Bros., of Goole.

ST. JOSEPH'S RETREAT, HIGHGATE-HILL.—On the 31st ult. the corner-stone was laid of the new elementary school for boys provided by the congregation of St. Joseph's, in order to meet the requirements of the London County Council Education Department. Mr. R. L. Curtis's plans provide for an increase of school-room of from 300 to 500 pupils, and the cost, which includes that for the improvement of the subsisting school for girls, amounts to about 4,500*l.* The site is a gift of the Passionist Fathers, who in 1858 acquired premises on Highgate-hill for their Retreat, and there on November 21, 1889, opened the present church, designed by Mr. Albert Vicars.

CLUB AND INSTITUTE, CHOPWELL.—A new club and institute has been erected at Chopwell by the Consett Iron Company, Ltd., for the use of their workmen. Mr. J. Oliver designed the building, which has cost about 4,000*l.*, the contractors being Messrs. Groves, of Chester-le-Street. The club comprises a bar, billiard-room, concert-room, reading-room, and games-room. It is illuminated throughout with electricity.

NEW THEATRE IN SHAFTESBURY-AVENUE, W.—The new theatre, to be known as the "Wardour-street Theatre," is to be opened shortly. The building forms the north-eastern wing of the newly-erected block of premises in Shaftesbury-avenue which includes the Hicks Theatre. The auditorium of the new building is 57 ft. wide, and measures 75 ft. from curtain line to the back wall of the pit. It is constructed partly on the cantilever system, no columns being used anywhere. The architect for the work is Mr. W. G. R. Sprague.

PROPOSED ENLARGEMENT OF THE WALTHAM HOSPITAL.—Dr. F. St. George Mivart, Local Government Board Inspector, recently held an inquiry at the Waltham Joint Hospital Board Offices, Warwick House, Buckhurst Hill, into the application of the Hospital Board for sanction to borrow 4,100*l.* for the extension of their hospital to enable them to include cases from Woodford. Mr. H. Tooley, architect, stated in the course of the inquiry that the proposed addition included a new sixteen-bed block, additions to the administrative block, fencing, making up of the road, and laying out of grounds. The construction of the additions would be similar to that of the existing building, the only difference being improved floors.

REBUILDING IN MARYLEBONE.—An extensive clearance has been made at the corner, north-west, of the crossing of Welbeck and Wigmore streets, embracing the site formerly occupied by Messrs. Benham & Sons, an old-established firm of ironmongers and kitchen furnishers. The new block of buildings, to be named "Welbeck House," will comprise some shops and residential flats and a hotel. The architects are Messrs. Boehmer & Gibbs; Mr. C. J. Hinsley is the general contractor.

NEW THEATRE, OLDHAM.—A scheme is now in the hands of promoters for the erection of a new variety theatre at the Bottom-o'-th'-Moor, Oldham. Mr. H. Arnold Turner, of Eccles and Manchester, has prepared plans for the proposed building.

INSTITUTE PREMISES, NEEDHAM MARKET.—New club and institute premises have been built at Needham Market from plans prepared by Mr. Henry J. Wright, of Ipswich. The building is of red brick and terra-cotta, and consists of refreshment and reading-rooms, kitchen, pantry, lavatories, etc., on the ground floor, and committee and concert hall capable of seating 150 upstairs.

COUNCIL SCHOOL, BUSHEY.—A new elementary school has been built by the County Council to meet the growing needs of Bushey, New Bushey, and South Watford. The accommodation is for a total of 600—300 boys, and at present 240 girls and 60 infants. The contractors for the work were Messrs. George Henson & Sons, of Wellingborough; the Clerk of the Works, on behalf of the County Council, Mr. C. H. Eatly. The County Surveyor, Mr. Urban Smith, was the architect.

PUBLIC HALL, BACKWORTH.—The new public hall at Backworth, which has been built by the members of the Workmen's Institute, has been completed and opened. The hall, which is about 90 ft. in length and 36 ft. wide, provides accommodation for 800 people. The premises were designed by Mr. W. Turnbull, of Backworth, and erected by Mr. J. Laverick, of North Shields.

SANATORIUM, KIRKCALDY.—A new sanatorium is being built at Kirkcaldy for the treatment of consumptives. The site, in the Den of Dunnikier, is in near proximity to the fever hospital. The building is to be of one story of brick, with dressing of red sandstone from Corncockle. Accommodation for fourteen beds will be provided. The erection is under the supervision of Mr. J. Lumsden, Burgh Surveyor, who prepared the plans.

CLOCK TOWER, TIVERTON.—Mr. Thomas Ford, J.P., the senior magistrate of Tiverton, is having erected at his own expense a clock tower upon Lowman Green. It has been designed by Mr. John Donkin, architect, of Bournemouth. On plan, the base is triangular, 15 ft. in diameter, resting upon three steps of blue Pennant stone. The rest of the fabric—which will rise to a height of over 50 ft.—is to be in Monk's Park stone. The general contractor is Mr. Stemson, of Tiverton, and the sculpture and other carved work have been placed in the hands of Messrs. Harry Hems & Sons, of Exeter. Mr. J. Siddalls, the Borough Surveyor, is acting professionally in the matter for the Town Council.

PAPER MILLS, SNODLAND.—The Snodland Paper Mills, belonging to Messrs. C. Townsend, Hook & Co., Ltd., which were destroyed by fire last year, are now being rebuilt. The principal entrance to the new mill is situate under a tower which rises to a height of 91 ft., and contains a clock worked by electricity, with 7-ft. dial, supplied by the Standard Time Company, London. To the west of this tower is a four-story structure of red brick, with Portland cement dressings, 200 ft. long, 80 ft. wide, and 70 ft. high. This structure has about 100 windows, containing 10,000 sq. ft. of glass. The chief engine will be 2,300 horse-power, and, besides being directly connected with the beaters, it will be coupled to an 850 k.w. generator, which will give off the current for driving the machinery and lighting the premises. Three machines are being installed for making the paper, and provision is made for two more; these will be accommodated in a building 222 ft. long, 180 ft. wide, and 17 ft. 6 in. high, the roof being supported in three spans upon steel stanchions. The fitters' and carpenters' shops escaped the fire, but in the reconstruction of the mill it has been found necessary to remove them to a more convenient position. The only additional land obtained for the new buildings is a piece to the left of the tower, where a range of offices, with board-room, sample store, etc., have been erected. Throughout the buildings patent automatic sprinklers have been provided. Messrs. G. E. Wallis & Sons, of Maidstone, constructed the three reservoirs, two of which are capable of holding 400,000 gallons of water each, and the other half of that quantity. Besides filters, facilities are provided for pumping this water into a large tank on the roof of the main building and another in the tower, from which it will be used in the manufacturing process or in case of fire. Mr. T. Taylor, A.M.I.M.E., prepared the plans.

FREE LIBRARY, HITHER GREEN.—The Carnegie library at Hither Green is now approaching completion. The building has been erected on a site at the junction of the Torridon and Sandhurst-roads, the funds (4,500*l.*) being provided by Mr. Andrew Carnegie. The principal front faces Torridon-road, the entrance being in the centre of this front. Immediately inside the entrance-doors is a vestibule, with ornamental granite flooring and newspaper slopes. To the right of the inner vestibule is the magazine and news room, divided by an oak screen into two portions—one for newspapers, the other for magazines. On the left of the entrance is the ladies' room. The lending library is 33 ft. square, with ornamental pilasters, arches, capitals, etc., and has a central domed light, ornamented with fibrous-plaster work. Adjoining the lending library is a store-room, a room for the use of the librarian's staff, lavatory accommodation, and a private entrance to the building for the caretaker. Below the staff-room is the heating chamber and coal store. The building is of red bricks and terra-cotta, with slated roofs, wood-block floors, ornamental glazing, etc. The architect for the building is Mr. Henry Hopton, of Catford, whose design was selected in competition.

NEW SCHOOL, GLAMORGAN.—The new Council School which has been erected at Pontrhydyfen, Port Talbot, was opened on Monday, September 11. The school consists of mixed and infants' departments, accommodating 400 scholars. The accommodation of the mixed department is for 260 scholars, and consists of five classrooms, central hall, teachers'-rooms, and the necessary cloak-rooms and store-rooms. The infants' department is in a separate building, and consists of three classrooms, marching space, teacher's-room, store-room, and cloak-room. The site is three-quarters of an acre in extent, and allows for excellent playgrounds. Play-sheds are provided. The buildings are faced with "Red Wilderness" stone, with "Forest of Dean" stone dressings, and the roofs are covered with Welsh slates. The central hall of the mixed department is surmounted by an oak flèche containing the school bell. Internally, all walls are lined with glazed bricks to a height of about 4 ft.; and a panel for free-arm drawing is provided. The floors are laid with pitch-pine blocks, on concrete. The internal woodwork throughout is stained and varnished. The school is heated by a low-pressure hot-water heating plant, but fireplaces are provided in case of emergency. The total cost of the building will amount to just over 6,000*l.* The contractors were Messrs. David Davies & Sons, Cardiff. Messrs. Richardson & Co., Darlington, supplied the heating plant. The architect was Mr. W. James Nash, County Education Architect.

FIRE-STATION, DUBLIN.—On the 13th inst. the new Central Fire Brigade Station in Tara-street, Dublin, was opened. The new building is the chief station for the whole extended city, and will also serve as the training school for firemen. Accommodation is provided for five engines or other horsed vehicles and two motors. A block of buildings, three stories high, fronting Townsend-street, contains a residence for the second officer and quarters for nine married firemen and their families. Between the married quarters and chief officer's house the block of two-storied buildings contains on upper floors—corn store, paint loft, with two-ton traversing

hoist, and a steam laundry; on the ground floor—a general store, workshop, with three-horse-power three-phase electric motor, line, shafting, and corn-bruising mill, and engine-repairing pit; beneath is a chamber for experiments and training recruits to working in smoke. On the other side of the yard is a reserve stable with two stalls and a loose box, an engine-house for reserve apparatus, and on the fireproof floor above is the forage loft, with a shoot leading down to the stables. Beneath the yard is a water tank from which the engines are tested and the sewage system flushed periodically, and standing up over the stable flat is a drill tower 67 ft. high, constructed of steel, with skeleton front and doors representing a six-storied building. The buildings generally are faced with red pressed Portmarnock bricks with moulded limestone or granite dressings and coping. The main frontage is of finely-chiselled limestone to first-floor level, with moulded plinth and string-course, heavily moulded and carved cornice, with balustrade and capping of limestone on top. All the buildings are of fire-resisting construction; walls plastered in cement to a dado moulding 3 ft. 6 in. above floors where not otherwise glazed or lined; floors of kitchens, bath-rooms, and passages are tiled. Bedroom floors are wood laid on bitumen. The total cost of the building, including all special fittings and paving, has been 21,840*l*. The plans were all prepared and the work executed under the supervision of Mr. Charles J. M'Carthy, City Architect.

Sanitary and Engineering News.

NEW DRAINAGE WORKS, CRAWLEY.—The new drainage works, which will deal with the sewage from the parishes of Crawley and Ifield, have been completed. The engineer was Mr. Sidney R. Lowcock, M.Inst.C.E., Westminster, London, and the contractors Messrs. Edwards & Co., of London. The sewage from the populous part of the district near Crawley railway-station and along the main Brighton road gravitates to the works, which are situate on the west side of the main road near County Oak. The sewage from County Oak and Ifield Village and Ifield Green also gravitates to the low level receiving tank at the works, and is pumped up to the screening-chamber. At the works the whole of the sewage is treated by bacterial processes. The final effluent travels through an outfall drain to the River Mole at the county boundary. Mr. E. J. W. Cutler was the resident engineer.

PROPOSED SEWERAGE SCHEME, CONONLEY.—On the 22nd ult. Mr. T. H. Tulloch, of the Local Government Board, held an inquiry into the proposal of the Skipton Rural District Council to carry out a sewerage scheme for the village of Cononley, to cost 2,850*l*. Mr. A. Rodwell, Surveyor to the District Council, explained the technical details of the scheme, and Mr. R. B. Broster, engineer, Keighley, gave evidence in favour of the scheme.

SELBY WATERWORKS.—The erection of the new Selby waterworks at Brayton Barff is now approaching completion. The estimated cost of the scheme is 30,000*l*. The works comprise an engine-house, boiler-house, coal depôt, and workshop, with manager's residence. The main building has two towers, under which are the pumps and bore-holes, the latter being sunk to a depth of 400 ft. The structure is of red brick with stone facings. The reservoir, which is capable of holding 800,000 gallons of water, is placed at the top of the "Barff," and is 150 ft. above the level of Selby and 170 ft. above that of the ordnance survey. The new scheme has been planned by Mr. Percy Griffith, M.Inst.C.E. (London), and Mr. Bruce McGreggor Gray, A.M.Inst.C.E. (Surveyor to the Selby Urban Council), and the work of erection was entrusted to Messrs. Parker & Sharp, contractors, of York.

PROPOSED SEWAGE WORKS FOR LINTHWAITE AND GOLCAR.—A new scheme has been submitted to the Local Government Board with a view to the sanction of the loan for the construction of sewage outfall and disposal works for the districts of Linthwaite and Golcar. The scheme has been prepared by Messrs. Abbey & Hanson, civil engineers, Huddersfield, and it will be applied to the flat land at the bottom of Johnny Moor-hill, adjacent to the River Colne. The total area is a little over 9 acres. It is proposed to adopt the bacterial system of treatment, with settlement in tanks and filtration by automatic sprinklers over coke or ash filters. Should natural filtration be necessary there is land for the purpose. The system will provide for a dry weather flow of 500,000 gallons daily of domestic sewage and trade effluents, the latter of which will be required to undergo preliminary treatment at the expense of the traders themselves for the removal of solids. In the original scheme the estimated cost of the works was under 10,000*l*., but it is expected that this amount will be exceeded in the present scheme.

NEW BRIDGE, PONTYPRIDD.—A new bridge is being built over the river Taff at Pontypridd. It was designed by Mr. P. R. A. Willoughby, C.E., in accordance with the Mouchel system of ferro-concrete, and comprises a centre span of 116 ft. and two end spans of 25 ft. each, and will have a total length of 172 ft. and a width of 25 ft. between parapets. The contractors were Messrs. Henry Page & Co., of Cardiff.

OFFENSIVE SEWERS IN THE WEST END.—Dr. T. Orme Dudfield, Medical Officer of Health for Kensington, in his annual report says that with the return of summer last year the usual shower of complaints began of noxious emanations from sewer ventilators and untrapped street gullies. Owing to the long continued prevalence of hot weather and absence of rain, the complaints were more numerous than in summers of ordinary climatic conditions, and they came from many parts of the borough. Complaints were received with regard to the sewers in Philbeach-gardens, where there are twenty-two untrapped (brick pit) gullies, six surface-sewer ventilators, and one 6-in. by 4-in. shaft ventilator. The nuisance is generally great in this thoroughfare, the sewer discharging at each horn of the crescent into the County Council's main line (Counter's Creek) sewer—a sewer which has often formed the subject of complaint. Serious complaints were again made with respect to the large circular ventilator immediately north of the railway bridge in Warwick-road, at the cab rank nearly opposite to the entrance to the Earl's Court Exhibition; and also with regard to a similar opening at the west end of Pembridge-square, on the County Council's main line ("Middle Level") sewer, and they were temporarily closed. But the most serious complaints came from residents in Clarendon-road and Cornwall-road, the nuisance having begun to manifest itself within a day or two after what is described as the "Relief" sewer came into operation. In last year's report mention was made of a letter received from the Chief Engineer of the County Council, dated July 9, in which it was stated that the said sewer, designed for the prevention of flooding of basements of houses in many streets, would be completed in about a fortnight—as it was. But no sooner had it been brought into operation than complaints of smells began to come in. Two may be cited: "Drains outside 120, Clarendon-road (Cornwall-road corner) are very offensive, and at times the odour is unbearable." "Continuous offensive and unhealthy smells arise from ventilation holes of new sewer laid through Clarendon-road and Cornwall-road." The latter quotation is from a complaint to the Council signed by many ratepayers. The sewer referred to commences from the Middle Level Sewer at the junction of Basing-road with Cornwall-road, running thence along Cornwall-road, Clarendon-road, and Holland-park-avenue to Upper Addison-gardens, where it discharges into the Counter's Creek Sewer. It is circular in shape, 5 ft. in diameter, and in its course of about 2,238 yds. is ventilated by seventeen circular gratings 24 in. in diameter. Complaints of the bad smells were received from residents in the vicinity of several of these openings, especially in Clarendon-road and Cornwall-road. Complaints in regard to the Council's own sewers were reported to the Works Committee and the Public Health Committee before the vacation; and during the vacation to the Borough Engineer with a view to compliance with a Standing Order which reads as follows: "*Gullies*—Offensive street gullies to be efficiently trapped. . . . *Sewer Ventilators*—In cases where complaints are made of nuisance or annoyance is caused by offensive smells from sewer ventilators, efforts are to be made to obtain consent for the fixing of shafts up adjacent houses, and where such consent is obtained, the objectionable ventilators are to be abolished." With respect to main line sewers, a further order is to the effect: "That the County Council be requested to trap with syphon traps all offensive gullies on the main line sewers." He was not in a position to say to what extent the standing order with respect to street gullies and ventilators to the Council's sewers was carried out in connexion with complaints received; but as regards the County Council's sewer ventilators the Chief Engineer informed him (Dr. Dudfield) that he had ordered the temporary closing of the opening connected with the Counter's Creek Sewer near the Earl's Court Exhibition entrance in Warwick-road, and the openings connected with the "Relief" sewer in Cornwall-road, in Clarendon-road, and in Holland-park-avenue. This sewer is usually empty as regards liquid matter, not receiving house drainage or road surface water, and it is not brought into operation until the sewage and storm water in the middle level sewer rises to a height of 32 in. above the invert, when overflow by means of a weir takes place, the discharge being into the Counter's Creek sewer as already stated. The empty sewer, it is to be feared, will serve as a reservoir for sewer gas acting as a ventilator to the middle level sewer and the Council's Creek sewer, in which event it may be expected that nuisance will be re-established when the ventilators shall have been re-opened. He (the Medical Officer) had correspondence with the Chief Engineer of the County Council on more than one occasion with respect to sewer smell complaints, and gladly testified to the Engineer's willingness to abate nuisance, temporarily at any rate, by closing offending openings; but he had felt some diffidence in pressing the matter, knowing that the Borough Council's own sewers were also often the cause of nuisance. It is a statutory duty of the County Council to provide sewers for main drainage and of borough councils to provide sewers for the drainage of their respective districts; but these authorities may not create nuisance in connexion therewith. The state of the law in regard to the question was explained by a sub-committee of the Law and Parliamentary Committee of the late Vestry, in a report on a reference by the Works and Sanitary Committee arising out of reports of nuisances he had made in 1897. The report which originally appeared in the minutes of the Vestry's proceedings (on October 6, 1897) will bear repetition. It reads as follows:

"Your Sub-committee have had before them the correspondence between the Vestry and the London County Council on this subject, and the report of the Medical Officer of Health on offensive smells in streets. They have also considered the various sections in different Acts of Parliament bearing on the same subject, and advise the Committee that, as to gullies, traps, and ventilators of sewers, the property of the Vestry, there is a clear liability on the Vestry in respect of nuisance arising therefrom. It must not be forgotten that the duty to cleanse every grating or gully in a street (except in streets cleansed by the Council), whether the gratings and gullies belong to the Council or the Vestry, is by the London County Council (General Powers) Act, 1894, transferred to the Vestry. As to sewers vested in the London County Council the obligation to cover and keep so as not to be a nuisance or injurious to health is on the Council under sect. 135 of the Act of 1855. Power is given to the Vestry (but only with the consent of and after notice to the Council) to prevent effluvia from exhaling from main sewers and in respect of these London County Council sewers, we advise that the London County Council are liable for nuisance occasioned by smells and not the Vestry. We recommend that the Works and Sanitary Committee be informed:—1. That they are bound to prevent the Vestry sewers, gully holes, and traps from being a nuisance, and must take all precautions to avoid the same, otherwise the Vestry may be liable at the suit of anyone showing injury, or the Vestry may be ordered to comply with their statutory duty by mandamus. With regard to the London County Council sewers, the Vestry may, on a flagrant case of nuisance being proved, through the Attorney-General proceed against the London County Council by information, or, in the alternative, apply for a mandamus to compel the Council to comply with sect. 135 above referred to. It has been suggested that a Council sewer (looking to the width of the definition clause) may come within the term 'premises' in sect. 2 of the Act of 1891; but, without giving a contrary opinion, we consider that a recent decision leaves it in considerable doubt whether the nuisance section in this Act alters, or adds anything to, the previous law as to sewers. Before taking action against the Council, the Works Committee would probably recommend that a further communication be addressed to the Council pointing out the gravity of the nuisance and the obligation the Vestry feel themselves under to protect residents by any means which they may be advised are available."

The Works and Sanitary Committee, on consideration of the report, recommended the adoption of the standing order cited above, and expressed the opinion that it was "most desirable . . . that action should be taken to secure a more efficient and less offensive mode of ventilating the sewers of the Metropolis" than by open street gratings. As regards street gullies, a part of the standing order was: "That all new gullies to be constructed in the (borough) be pan gullies with syphon trapped outlets." At the date of the committee's report there were upwards of 6,000 untrapped gullies in the parish liable to emit offensive smells, besides a very large number of ventilating openings at street level. The subject is deserving of the consideration of the Council, little, relatively, having been done by way of giving effect to the excellent recommendations contained in the report of the Works Committee, or to comply with the requirements of the law as set out in the report of the Law and Parliamentary Committee of the late Vestry.

LONDON COUNTY COUNCIL SEWERS IN GREENWICH.—Dr. E. G. Annis, Medical Officer of Health for Greenwich, in his annual report just issued says that extremely offensive emanations still continue to be given off from the London County Council's main southern outfall sewer as it passes through the district. During 1906 two new large sewers had been constructed, viz., one 11 ft. 6 in. barrel main sewer from Catford to Plumstead, which reaches the Greenwich Borough at Blackheath, and thence passes through the borough to the Woolwich boundary, having throughout its length seventeen manholes at the street level for ventilating purposes, the other a large low-level southern outfall sewer, which passes from the Norman-road pumping station through the borough to the Woolwich boundary, and is ventilated by nineteen such manholes at the street level. If as much nuisance arises from these two new sewers as has been experienced from the southern outfall sewer itself, the Public Health Department must certainly expect to be

overwhelmed with complaints. In this connexion the Council had authorised an expenditure of 50*l.* upon certain experiments with regard to the production of ozone in the manhole outlets from the sewer to see if this would in any way check the great nuisance arising from same. Up to the time of writing (April, 1907) the experiments had not been completed.

SICKNESS AND SANITARY DEFECTS.—Dr. Henry Kenwood, Medical Officer of Health for Stoke Newington, in his annual report just issued states that during the year notices were received of 267 cases of infectious disease occurring in 238 different houses. A visit was paid to each house, and it was ascertained that in nine houses there were "grave" sanitary defects and in twenty-six there were "slight" sanitary defects. In arriving at the foregoing conclusion he (Dr. Kenwood) had considered whether any sanitary defects discovered were of a nature which is generally held by health officers to predispose to, or directly bring about, the particular disease in question.

Foreign.

MEXICO. — Mr. Buchanan, British vice-consul at Tehuantepec, in his annual report to the Foreign Office, remarks that the districts of Tehuantepec and Juchitan are but sparsely populated, with the exceptions of the towns of Tehuantepec, Juchitan, San Geronimo, and Salina Cruz, though ruins and other indications show that at one time these districts were among the most densely populated in Mexico. Salina Cruz, formerly an insignificant village on the Gulf of Tehuantepec, has in the last four years become a rapidly-growing modern town, well laid out with wide streets and numerous open squares, and already equipped with a good water and sewerage system. The population at present is close upon 10,000, including a foreign colony of 250, the majority of whom are British. The climate is hot and dry, but healthy. The temperature averages 82° F. The rainy season extends over the months of June to September inclusive, but the rainfall is comparatively light. From November to April the prevailing wind is from the north, at times blowing with hurricane force, which makes Salina Cruz difficult of approach by sailing vessels. Salina Cruz is now the most important Mexican Pacific port, and, as the Pacific terminus of the Tehuantepec National Railway, is destined soon to take a prominent place among the world's commercial ports. The Mexican Government contracted with the British firm of Messrs. S. Pearson & Son, Ltd., some seven years ago for the construction of immense harbour works and the building of a dry dock. The harbour works consist of two immense breakwaters forming an outer harbour, an inner concrete wall one mile in length, and an inside harbour or basin dredged out to a depth of 10 metres. The work is being most excellently done, and when completed Salina Cruz will have an absolutely safe harbour, with one mile of docks equipped with the most modern electrical apparatus for handling cargo rapidly. The dry dock will be the largest south of San Francisco, capable of accommodating any vessel now in the Pacific trade. The contract calls for the completion of the whole works by April, 1909, and the total cost will be in the neighbourhood of 4,000,000*l.* The works were sufficiently advanced for the railway to begin its proposed transcontinental trade in January, 1907. The railway, which will be worked by the Mexican Government, in partnership with Messrs. S. Pearson & Son, Ltd., expect to handle through Salina Cruz at least 500,000 tons of freight during the first year, 1907. Salina Cruz will be the natural port for travel between the Central American Republics and the United States and Europe. By rail it is only thirty-six hours from Mexico City, seven days to New York, nine days to San Francisco, and fifteen days to London via New York. The hotel accommodation is at present poor, but this will soon be remedied. Native labour has proved more satisfactory than imported labour, but is not sufficient to meet the demand. Native mechanics, carpenters, and masons earn two and a half to four dollars per day. In the port works native labour is used almost exclusively, with British or American foremen. Stone for the port works and breakwaters has been brought from a quarry near Tehuantepec, twenty miles distant from Salina Cruz. The granite for the docks and dry dock has been brought from Norway in British sailing vessels. Buildings have been constructed of brick (native), stone (rubble masonry), and lumber. Lime is burnt at several places on the Isthmus of Tehuantepec, and obtained both from shell deposits and limestone. Cement landed at the port costs from seven to eleven dollars Mexican (14s. to 1*l.* 2s.) per barrel, the best Portland cement bringing the highest price. Native-burnt bricks cost 20 to 25 dollars (2*l.* to 2*l.* 10s.) per 1,000. Native-burnt tiles of the Spanish type are used considerably for roofing, but for the principal buildings in connexion with the port works tiles from Belgium and the United Kingdom (principally from Belgium) have been used. Corrugated iron is also used extensively, and is always in demand. The structural steel was mostly supplied by Messrs. McLelland & Co., of Glasgow.

PROGRESS IN PERAK.—Mr. E. W. Birch, British Resident in Perak, which is the principal of the Federated Malay States, writes in his annual report, just issued, that Kuala Kangsar, the seat of the Sultan, has been greatly improved, and the past year saw the completion of the two magnificent houses which his Highness has built for his wives, the construction of a very handsome Mosque, given by the Sultan to his people, and the erection of a well-designed residence for the High Commissioner. A site for the new Malay College was selected and levelled, and the construction of the masters' bungalows was begun. A new road connecting the town with the railway station was opened. The Art School, which was commenced in 1902, has made considerable progress, and ten boys and fourteen girls under experienced teachers are learning Malay industries, and turn out very creditable work. Sungei Siput, the centre of a good deal of mining, is the busiest town of the Kuala Kangsar district; building operations there are brisk. Ipoh is growing apace. It is in a state of transition, which makes it in many ways inconvenient and unsightly. Building is going on everywhere. Land is being reclaimed, and the method of reclamation is, in some cases, unsavoury. Bridges are being erected, and the progress of construction does not facilitate traffic, but it will eventually be a town which will excite the admiration of visitors. The close of 1907, indeed, will see a marvellous change in Ipoh. The new iron bridge over the Kinter River in Brewster-street will be rendered in concrete and widened. The most up-to-date abattoirs in Malaya will be in use. A splendid new market will be the envy of other places in the Federated Malay States. The water supply will be considerably augmented. A new iron bridge over the Pari River on the Lahat-road will be under construction, and so will the railway to Tronoh, which will greatly enhance town property at Ipoh. A large English school is about to be built. An open space on Connolly-road has been reserved for clerks; the Government is erecting twenty-three quarters for them, and giving them a recreation ground, while they are building a club for themselves. Last, but not least, the People's Park will be almost ready to hand over to the people. It will be an eminently suitable place for recreation for that class of the inhabitants for whose use it is intended, and it represents a gift by the Government of 70,000 dollars.

Miscellaneous.

BELGIAN CEMENT.—Sir Cecil Hertslet, the British Consul-General in Belgium, deals at some length in his annual report with the cement trade of that country. During the year 1906 the total exports of Belgian cement amounted to 910,928*l.* in value, the quantity being 813,329 tons. The corresponding figures for 1905 were 652,249*l.* in value and 678,825 tons in quantity. As to that sent to the United Kingdom there was a falling-off amounting to 45,309 tons and 19,294*l.*, the 1906 totals being 151,274 tons, valued at 169,426*l.* In regard to British Colonies the cement exports reached a considerable volume. Australia took 2,498 tons, valued at 2,797*l.*; Canada, 10,083 tons, worth 11,292*l.*; Cape Colony followed with 8,055 tons, of a value of 9,022*l.*; India received 8,460 tons, the export value being 9,479*l.*; Natal, 8,714 tons, worth 9,760*l.*; and the Straits Settlements, 2,562 tons, of a value of 2,869*l.* In addition to the above the exports of Belgian cement to Egypt amounted to 37,487 tons and 41,985*l.* Not only did the exports to the United Kidgdom fall off in 1906, but those to British colonies also declined in every case, some of the decreases being considerable. It is difficult (observes Sir Cecil Hertslet) to explain this lesser demand from British possessions for Belgian cement unless it is that buyers are beginning to realise that much of the cement manufactured in Belgium, described as "Portland," and bearing British marks and brands, is not the genuine article, but is in every sense inferior to the British production, and in many cases is not entitled to be called "Portland" cement at all, according to the accepted standard. It is manifestly unfair to the maker in the United Kingdom that Belgian cement can be sent to the British Isles, the colonies, and foreign countries in the enormous quantities which it is bearing descriptions and labels in English, the obvious intention of which is to encourage the supposition that the article sold is British made. The blame cannot be put so much upon the manufacturers themselves as upon the commission agents and dealers of that class who furnish any labels that may be required to the makers to attach to the barrels or casks when forwarded from the works, many of which labels are without doubt infringements of trade marks of makers in the United Kingdom. Persons who purchase Belgian cement are also open to criticism, provided that they dispose of it to credulous buyers with British labels attached. Many Belgian commission agents are aware of the risks they run in shipping cheap Belgian cement bearing labels which are registered as trade marks of British firms. With vigilance such measures can be arrested, but it is difficult for the British manufacturer to trace the fraudulent imitations which are being passed off under his particular brand in the colonies and foreign countries.

PROPOSED RECREATION GROUND, ILFORD.—Mr. W. O. Meade-King, M.Inst.C.E., Local Government Board Inspector, held an inquiry recently at Ilford Town Hall into the Ilford Urban District Council's application to borrow 2,350*l.* for the purchase of land for a recreation ground in the Loxford Ward. Mr. J. W. Benton (Clerk to the Council) said the Council had asked for the sanction of this loan for the purpose of purchasing two and seven-tenths acres of land situate in Uphall-road for the purpose of a recreation ground for Loxford Ward. The Council had paid 1,800*l.* for the land, which was freehold, and the fencing would cost 117*l.* 12s., and there were other expenses for levelling the ground, etc., the total cost being estimated at 2,200*l.* Mr. H. Shaw, the Council's Surveyor, also gave evidence.

ROBERT FORD MEMORIAL, GLASGOW.—A memorial has been erected in Sandymount Cemetery to the memory of the late Mr. Robert Ford. It takes the form of a rustic monument (the work of Scott and Rae), with bronze portrait medallion by Mr. W. M. Petrie.

SCOTTISH BUILDING TRADES' FEDERATION.—The annual meeting of the Scottish Building Trades' Federation was recently held at Dundee. Mr. Patrick Knox, Edinburgh, President, occupied the chair, and delegates were present from Edinburgh, Glasgow, Aberdeen, Dundee, Inverness, and other centres. The Executive's report for the past year showed that trade was dull and depressed all over the country. Paisley, Kilmarnock, Perth, Aberdeen, Coatbridge, Oban, Inverness, Motherwell, and Dundee were all suffering from the present depression, while Glasgow and Edinburgh were also affected. A resolution was unanimously passed protesting against the Secretary for State's decision not to add a member of the Scottish building trades to the Departmental Committee appointed by him to inquire into the system of scaffolding in England and Scotland. It was pointed out that the Committee as at present constituted are not familiar with the customs and practices of the building trades in Scotland, and more particularly the several modes of Scotch scaffolding. The interests of employers in the building trades in Scotland ought to have been directly represented on the Departmental Committee by a Scotch employer familiar with Scotch methods. As grave hardship might result, the meeting protested against the manner in which employers had been ignored, more especially as it was intended to apply certain new scaffolding regulations to Scotland. The Secretary was instructed to forward the resolution to the Secretary for State, the Lord-Advocate, and the members of Parliament for the towns represented in the Federation. Mr. William Nicoll, builder, Dundee, was elected President for the ensuing year, and Mr. James Leslie, builder, Aberdeen, Vice-President. It was agreed to hold the next meeting in Aberdeen.

ASPHALT PAVING.—The Limmer Asphalt Paving Company, Ltd., have sent us a booklet relating to Mineral Lithofalt Asphalt. This material is used in the form of paving blocks; and also as mastic, for laying *in situ*. The blocks are all 9 in. long by 4½ in. wide, but are made 1 in. thick for floors and footways, 1½ in. thick for stables, and 2 in. thick for roadways. The Lithofalt mastic is used principally for paving alleys, courtyards, and footways. Judging from the sample block which has been sent to us, Mineral Lithofalt Asphalt appears to be a very good paving material.

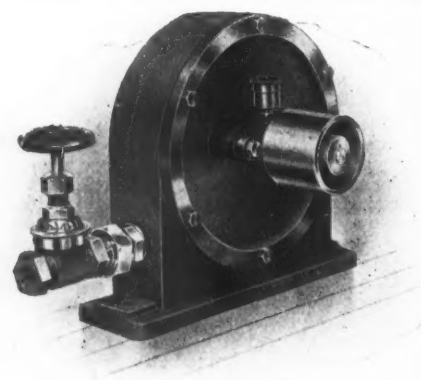
NORTHAMPTON (POLYTECHNIC) INSTITUTE, LONDON.—The provision last session of increased accommodation in the rooms of the British Horological Institute in Northampton-square has made it possible to introduce further developments in the work of the departments, which continue to find their quarters in the original building, as well as in that of the department of Technical Optics. The most noteworthy of these developments is a course on the "Production and Measurement of Light," which is being given to both day and evening students by the Electrical Engineering and Applied Physics Department and by the Department of Technical Chemistry jointly. The lectures and laboratory work in the Electrical Engineering Department deal with all the various kinds of electric lamps, glow, arc, and luminescent; with the problems of the production of light, and photometry, and general questions of radiation. In the Technical Chemistry Department the subject is taken up from the chemical side, and the whole subject of incandescent lighting dealt with. The properties of rare metals and rare earths, their production,

extraction, and use for all kinds of incandescent lighting, both gas and electric, are fully dealt with, and the production of metallic filaments for electric glow lamps is thoroughly studied. In the engineering day courses further options have been introduced for the more advanced work of the third and fourth year, and advanced work for an additional year has been provided in the Technical Optics Day Courses. The subject of electric wiremen's work has been remodelled, and is dealt with in accordance with the revised syllabuses recently issued by the City and Guilds of London Institute. The classes in telegraphy and telephony have also been remodelled. In the Technical Optics Department four new classes, especially suitable for artisan students, are being started, and minor changes have been made in the syllabuses.

"PATENTED BARS IN REINFORCED CONCRETE."—The writer of the letter under this head in our last issue writes: "Referring to my letter on this subject, which appears in your issue of September 14, I note that a clerical error appears to have been made in the amount of royalty or designing fee on round rods and loose stirrups. In my comparison of costs this is rightly taken at 12½ per cent. royalty, but in the succeeding remarks it has been interpreted as 12s. 2d. per cent. in error. That there may be no confusion I would point out that the figure should be the same in both cases, that is to say, £12 10s. per cent." [The mistake is the writer's, not ours; it was printed as written.]

THE HARDWICK TAPESTRIES.—The Decorative Needlework Society have completed the repair of another piece of the Duke of Devonshire's XVth-century tapestries from Hardwick. The tapestry, which may be seen in the Victoria and Albert Museum, represents some hawking scenes with figures upon horseback and upon foot, and with a castle and a church in the background, beautifully coloured and grouped. Another piece, representing a bear hunt, was lately exhibited, and has been photographed by Mr. W. G. Thomson. It is supposed that the tapestries were woven to commemorate the nuptials of Henry VI. and Margaret of Anjou. They were discovered behind the pictures in the Long Gallery at Hardwick, and in a somewhat mutilated condition. Their restoration has been effected, thus far, by placing the defective piece upon a loom and securing the old warp threads to the new ones, so that the weaver could complete the work in accordance with the original design.

THE PITMAN WATER MOTOR.—A standard type of Pelton water motor, as made by Mr. Percy Pitman, of Pershore, is illustrated in accompanying cut. The machine in question has a wheel of 3 ft. pitch diameter running at 280 revolutions per minute, motive power being furnished by water at 60 lb. per sq. in. pressure. The buckets are of phosphor bronze, carefully machined to the rim of the wheel, thereby insuring static and dynamic balance. As may be seen by



the illustration the wheel is enclosed in a cast-iron casing with a base of suitable design for holding-down bolts. The discharge nozzles can be adjusted to vary the power as required, and additional means of control is afforded by the regulating valve shown. The motor is capable of developing up to 30-brake horse-power, and is used for driving a 26-in. circular saw, a band saw, and a wood-turning lathe. This form of water motor has been used to a considerable extent in driving wood-working machinery and contractor's plant generally—purposes for which it should be found very useful in places where hydraulic power is available.

FOSSDYKE, LINCOLNSHIRE.—Proposals are made for building a more suitable structure to replace the bridge which was erected, in lieu of the old ferry, about 100 years ago, for the transit by road to London of the cattle which were carried by sea from Scotland to Grimsby and Hull. The parish, which separates the parts of Lindsey from those of Kesteven, is named after the fosse dyke, which Henry II. caused to be constructed between the rivers Witham and Trent.

NOTRE DAME, BRUGES: AN INTERESTING PRINT.—It is probably not generally known, even at Bruges, that the Church of Notre Dame formerly had a gable at the eastern end of the north aisle, and facing north. It was a simple affair, but it relieved the long straight line of the aisle. Possibly it was a remnant of a row of gables, one to each bay, on that side of the church. The one in question was almost large enough to be a transept one, but the great steeple, which, by the way, is 32 ft. higher than Salisbury spire, stands in the way of a transept being on that side of the church. A lithographic illustration showing the gable occurs in F. Stroobant's Guide to Bruges of about 1870.

CIVIL ADMINISTRATION AND FINANCE, CITY OF LONDON.—The annual reports for 1906 of the various departments of the Corporation show in the aggregate balance-sheet that the total liabilities of the City's estate, sinking fund included, amount to 3,990,129*l.*, of which sum loans represent 3,726,600*l.* Total liabilities of 7,062,993*l.*, sinking fund of 311,654*l.*, and sundry surpluses of 68,268*l.* make up the total debits of 7,442,915*l.* The City's estate of 438,982*l.* is included in the total assets of 1,949,077*l.*, and the total of outstanding loans is 6,535,950*l.* The City Engineer, Mr. Frank Sumner, reports that the weekly rents at the Artisans' and Labourers' Dwellings ranged from 4s. to 9s. for 241 tenements containing 535 rooms; a saving of 490*l.* resulted from the experimental lighting of certain thoroughfares with incandescent gas in place of electrical arcs supplemented with gas; the completion of the system of lighting with incandescent gas-burners; the widening of Bury, Wood, Throgmorton, Wormwood and other streets; and the widening, in progress, of Fleet, Mansell, Gracechurch, and Giltspur streets, and of Little Britain, Love-lane, and Cloth-fair. The Chamberlain reports that the civil government cost 42,274*l.*, including the Lord Mayor's salary, 10,000*l.*, and that the Mansion House and mayoralty absorbed 7,366*l.*, comprising 1,884*l.* for maintenance and repairs, and 565*l.* for repainting the Egyptian Hall; the maintenance and repair of the Guildhall cost 4,949*l.* The Market accounts show profits in respect of the London Central (38,312*l.*), Billingsgate (4,931*l.*), and Leadenhall (1,090*l.*) Markets, but adverse balances for the Islington Cattle (3,549*l.*), Shadwell, (2,192*l.*), Spitalfields (2,603*l.*), and Deptford Foreign Cattle (4,265*l.*) Markets.

ST. URSULA'S HOME, HOLBORN.—A local charity has been established for the provision at a moderate cost, in the St. Alban Ecclesiastical District, and under the household management of a committee of ladies, of a home for the daughters of clergymen or professional men having their occupations in the city or county of London. The Charity Commissioners have framed a set of regulations to enable the trustees of the charity to effect a purchase of Evelyn's buildings, a house in Brooke's-market on the north side of Holborn, and to alter and repair the premises so as to adapt them for purposes of the home. Under the scheme the trustees are empowered to apply part of the yearly income of the charity to a fund for the upkeep and repairs of Evelyn's-buildings on behalf of the home.

A DECEASED BUILDER'S ESTATE.—The late Mr. Edward Yates, of Southwark and Shore Hall, Essex, who died on April 26, has left estate of the gross value of 919,414*l.*, with net personalty of 748,304*l.*

AYR AULD BRIG.—In a report to Messrs. Shaw & Welsh, Honorary Secretaries, Ayr Auld Brig Preservation Committee, dated September 11, Mr. W. S. Wilson, the engineer, states:—The pointing of three arches and three piers is completed; the roadway the whole length of the bridge has been removed, and the four arches have been repaired and strengthened with a covering of concrete as formerly described. The cross walls at the piers and the central spandril walls are all finished. The electric motor has proved satisfatory, and the grouting of piers Nos. 1 and 2 is done. The pit in the No. 1 pier is down the full depth of 39½ ft. from the road level; the concrete floor has been laid, and the excavation for underpinning is going on. The pit in No. 2 pier is down 24 ft. from the road level.

THE "IDEAL" WINDOW.—We have received drawings of this form of patented sash, called in Germany "Schaetzke's Ideal-Patent-Fenster," and have also procured the English patent specification for it, which however is obscurely worded and not well illustrated. As far as the drawings indicate, it seems to be an important novelty in window sash construction; but we are obliged to adhere to our usual rule, to pronounce no decisive opinion on an invention of this kind except on the basis of a working model, which the patentees say they are not able to submit to us at present. The proof of all these things is in the actual working.

Patents of the Week.

APPLICATIONS PUBLISHED.*

18,560 of 1906.—O. SACHSE: *Manufacture of Hollow Bricks.*

This relates to the manufacture of hollow bricks wherein the internal cavities are closed by applying suitable and separate lids, covers, or tiles to the bricks without further pressure in the press before they are burnt, in such manner that the lids or covers are thoroughly united with the body of the brick in the process of burning, and that the hollow brick may not be endangered in the process of drying, owing to the development of internal pressure.

18,647 of 1906.—H. FALKNER: *Ventilating Cowls.*

This relates to ventilating cowls which are composed of fixed and rotating parts, and consists in the method of coupling the parts by providing pins or projections on one part and a corresponding slit or slot on the other part.

19,897 of 1906.—W. GELDARD: *Fire-bar Connexions for Stoves and Fireplaces.*

This relates to fire-bar connexions for stoves and fireplaces, and comprises two or more fire-bars with a flange or flanges at each, end and side cheeks with corresponding recesses or holes, so that when the ends of the fire-bars are placed in the recesses or holes of the said cheeks, the whole are interlocked and secured by a key.

21,531 of 1906.—J. MUSKETT: *Armoured Hose Applicable for Ventilating Purposes.*

This relates to a hose for ventilating purposes consisting of a tubular canvas hose woven or plaited from any suitable fibre with internal and external coils of wire, the spirals of the external coil being arranged in the spaces of the internal coil of wire, the two coils gripping the woven hose between them, and thus preserving the full bore of the hose, and the coils of wire being produced by apparatus used for armouring hose so that they receive a permanent coil.

21,708 of 1906.—S. BARNETT and R. J. HADLINGTON: *Kilns for Bricks.*

This relates to a series of continuous formation of kiln chambers of the muffle type, having intermediately positioned grates extending for the entire length of the chamber, and consists in controlling the waste gases in their passage between the chambers and the fire-grates.

22,448 of 1906.—C. F. HALL: *Manufacture of Enamelled Metallic Tiles.*

This relates to the manufacture of enamelled tiles and the like, and consists in forming a roughened surface at the back of an enamelled tile or the like by enamelling the tile on both sides and whilst still hot placing it upon sand, grit, or like material, some of which becomes embedded in the plastic enamel at the back and so becomes firmly attached to the back of the plate as the enamel thereon cools and hardens.

23,030 of 1906.—G. F. VAUGHAN, E. VAUGHAN, A. H. VAUGHAN, and G. SATTERTHWAITE: *Fastenings for Sliding Doors.*

This relates to a fastening for sliding doors, comprising a bolt which is carried by the door and of which the head is capable of vertical movement in relation to the door, a catch which is carried by the door jamb, and a part which, as the door is closed, is moved and thereby moves the catch into engagement with the bolt.

23,163 of 1906.—A. DOMAN: *Gutter Brackets.*

This relates to a gutter bracket consisting of a cup or seating cut lengthways from a strip of metal, and supported on a suitable bracket or rod, and consists in the use of tongues of such shape that they may be cut without waste of metal except at the ends of the original strip.

24,655 of 1906.—M. BREACH: *Updraught Cowl.*

This relates to an updraught cowl, comprising an outwardly and upwardly tapering conoidal throat-piece fitted upon the upper end of the educt pipe, one or more overlapping conoidal rings over said throat-pipe, each of said rings being open below and being provided with a depending apron or curtain at its lower edge and with an upwardly extending collar at its upper edge, and a conoidal cap surmounting the whole.

25,101 of 1906.—C. J. REYNOLDS: *Range Boilers.*

This relates to a range having an oven at one side or each side of the firegrate, and comprises a boiler arranged at the back of the firegrate, and with flues beneath it and at its sides and back, said flues having communication with the firegrate at the bottom of the boiler, and the oven flue or oven flues constituting the only communication between the flues of the boiller and the chimney.

* All these applications are in the stage in which opposition to the grant of Patents upon them can be made.

PATENTS.—*Continued on page 325.*

List of Competitions, Contracts, etc.

For some Contracts still open, but not included in this List, see previous issues. Those with an asterisk (*) are advertised in this Number: Competitions, —.; Contracts, iv. vi. viii. x.; Public Appointments, xix.; Auction Sales, xxx.

Certain conditions, beyond those given in the following information, are imposed in some cases, such as: the advertisers do not bind themselves to accept the lowest or any tender; that a fair wages clause shall be observed; that no allowance will be made for tenders; and that deposits are returned on receipt of a bonâ-fide tender unless stated to the contrary.

The date given at the commencement of each paragraph is the latest date when the tender, or the names of those willing to submit tenders, may be sent in.

*** It must be understood that the following paragraphs are printed as news, and not as advertisements: and that while every endeavour is made to ensure accuracy, we cannot be responsible for errors that *may* occur.

Contracts.

BUILDING.

SEPTEMBER 23.—**Cardiff.**—CONVENIENCE.—Tenders are invited for the construction of a public convenience in Penarth-road. Plan, specification, and conditions of contract may be seen and bill of quantities obtained at the office of Mr. W. Harpur, M.Inst.C.E., City Engineer, City Hall, Cardiff.

SEPTEMBER 23.—**Great Harwood.**—CO-OPERATIVE PREMISES.—Proposed new central premises, Glebe-street, Great Harwood, for the committee of the Great Harwood Industrial Co-operative Society Ltd. Names should be sent to the architect, Mr. Fred J. Parkinson, 9, Richmond-terrace, Blackburn, accompanied by a deposit of 2*l.* 2s.

SEPTEMBER 23.—**Hull.**—CLUB PREMISES.—Tenders are invited for the demolition of the existing buildings now upon the site and for the erection of new club premises in West Dock-avenue, Hull, for the St. Andrew's Recreation Club Company Ltd. Drawings, specifications, and conditions of contract can be seen, and bills of quantities obtained, on payment of 1*l.* at the offices of Mr. Arthur Easton, architect and surveyor, 7, Land-of-Green-Ginger, Hull.

SEPTEMBER 23.—**Llantwit Vardre.**—COTTAGES.—Tenders are invited for the erection of twenty-one cottages at Llantwit Vardre for the Crown Building Club. Plans and specification can be seen at offices of Messrs. Evans Williams and Evans, architects, Pontypridd.

SEPTEMBER 23.—**Wellhouse.**—BRANCH STORE.—Tenders are invited for the erection of a branch store and butcher's shop at Wellhouse, Golcar, for the Slaithwaite Equitable Industrial Society, Ltd. Plans may be seen and bills of quantities obtained at the offices of Mr. J. Berry, architect and surveyor, 3, Market-place, Huddersfield.

SEPTEMBER 24.—**Morley.**—EXTENSIONS TO MILLS.—Tenders are invited for the various works required in the proposed extensions to Lane Side Mills, Morley, for Messrs. Charles Scarth and Sons Ltd. Plans and specifications may be seen and a copy of the quantities obtained at offices of Messrs. T. A. Buttery and S. B. Birds, architects, Queen-street, Morley.

SEPTEMBER 25.—**Dromin, Co. Louth.**—CHURCH EXTENSION.—Tenders are invited for works of addition and improvement to Dromin Church, Co. Louth, for the Rev. John Byrne, P.P. Plans, etc., may be seen at the Presbytery, Dunleer, or at offices of Mr. J. V. Brennan, C.E., architect, Belfast Bank-chambers, Belfast.

SEPTEMBER 25.—**Scarborough.**—HARBOUR IMPROVEMENTS.—Scarborough Harbour Commissioners invite tenders for the extension of the West Pier, deepening of the Old and East Harbours, and underpinning of the quay walls. Plans may be seen and copies of specification and forms of tender obtained at the office of Mr. J. D. Howkins, C.E., Hartlepool, or at the office of the Clerk to the Commissioners, King-street, Scarborough.

SEPTEMBER 26.—**Downnouse.**—DWELLING HOUSE.—Tenders are invited for the erection of a dwelling house at Downhouse, Stokeclimsland, for Mr. L. Philp. Plans and specifications may be seen on application to Mr. Lawrence Scantlebury, architect, Cadington.

SEPTEMBER 26.—**Huddersfield.**—HOUSE AND SHOP.—Tenders are invited for any or all of the various works required in the erection of a house and shop at the corner of King's Mill-road and the Moldgreen-road, Huddersfield. Drawings and specifications may be seen and bills of quantities obtained at the office of Messrs John Kirk and Sons, architects, John William-street, Huddersfield.

SEPTEMBER 26.—**Hull.**—STATION GOVERNOR HOUSE.—East Hull Gas Company directors invite tenders for the erection of a station governor house at the gas works, St. Mark-street, Hull. Plans and specifications may be seen and further information obtained on application at the engineer's office at the gas works. Quantities supplied on personal application to parties tendering for the whole of the works.

SEPTEMBER 27.—**Town End.**—DWELLING HOUSE AND SHOP.—Tenders are invited for the various works required in the erection of dwelling house and shop at Town End, Golcar. Plans may be seen and quantities obtained at the office of Mr. Joe Ainley, architect and surveyor, Chapel-street, Slaithwaite.

SEPTEMBER 28.—**Chisledon.**—ALTERATIONS.—Tenders are invited for the alteration of the Odd-Fellows' Hall, Chisledon, into an infants' school. Plans and specifications can be seen at the office of Mr. R. J. Beswick, M.S.A., architect, 10, Victoria-road, Swindon, between the hours of 10 and 4.

SEPTEMBER 28.—**Maesteg.**—DWELLING HOUSES AND SHOPS.—Tenders are invited for the erection of two shops and dwelling houses at Commercial-street, and two lock-up shops at Talbot-street, Maesteg, for Mr E. Evans Bevan. Plans and specifications may be seen and bills and quantities obtained at the offices of Mr. J. Cook Rees, architect, Neath.

SEPTEMBER 30.—**Glasgow.**—INFIRMARY BLOCK.—Glasgow Royal Infirmary managers invite tenders for the mason, wright, plumber, plaster, and tile works of the superstructure of the north wing of the gatehouse block. Drawings may be seen at the office of the architect, Mr. James Miller, A.R.S.A., 15, Blythswood-square, Glasgow, from whom also copies of the schedules may be obtained on payment of 1*l.* 1s.

SEPTEMBER 30.—**Heywood.**—SCHOOL.—Heywood T.C. invite tenders for the erection of the proposed Hopwood council school. The necessary drawings, conditions, and quantities can be inspected at the office of Mr H. Cooper Anderson, M.S.A., architect and surveyor, William-street, Heywood. Quantities will be supplied to each person depositing 3*l.* 3s.

OCTOBER 1.—**St. Neot.**—CHAPEL RENOVATION.—Tenders are invited for new seating and renovating the Wesleyan Methodist Chapel at St. Neot. Plans and specifications may be seen at the office of Mr. J. H. Davey, Green Bank-road, Liskeard.

OCTOBER 2.—**Widnes.**—CHURCH.—Tenders are invited for the erection of the new Church of St. Mary's, Widnes. Plans and specifications prepared by Messrs. Austin and Paley, architects, Lancaster, may be seen at the present temporary church, and bills of quantities may be obtained on application to Messrs. Wright and Son, Surveyors, Lancaster.

OCTOBER 3.—**Ashby-de-la-Zouch.**—SCHOOL ENLARGEMENT.—Leicestershire C.C. Education Committee invite tenders for the enlargement of the boys' grammar school at Ashby-de-la-Zouch and other works connected therewith. Conditions of contract, quantities, and form of tender may be obtained from the architects, Messrs. Barrowcliff and Allcock, Town Hall Chambers, Loughborough, on payment of a sum of 2*l.* 2s. for each set of quantities.

OCTOBER 4.—**Listowel.**—CHURCH ADDITIONS.—Tenders are invited for the execution of certain works comprised in the erection of new chancel, side chapels, aisles, etc., to the Catholic Church, Listowel, Co. Kerry, for the Very Rev. Canon T. Davis, P.P., V.F., according to the plans and specification prepared by Messrs. Ashlin and Coleman, architects, 7, Dawson-street, Dublin. Bills of quantities have been prepared by Mr. D. W. Morris, surveyor, 68, Harcourt-street, Dublin, and can be obtained from him on payment of 2*l.* 2s. Plans and specification can be inspected at the architects' offices, or at the Presbytery, Listowel.

* OCTOBER 4.—**London.**—POST OFFICE.—The Commissioners of H.M. Works, etc., invite tenders for the rebuilding of the Aldgate branch post office. E. For further particulars see advertisement in this issue.

OCTOBER 4.—**Salford.**—BAKEHOUSE.—Salford Guardians invite tenders for the erection of a bakehouse at the Union Workhouse, Eccles New-road, Salford. Copy of specification and full particulars may be obtained from Mr. H. Lord, F.R.I.B.A., 42, Deansgate, Manchester.

* OCTOBER 8.—**Edmonton.**—BATHROOMS.—The Guardians of the Edmonton Union invite tenders for two small bathrooms at workhouse, Bridport-road, Upper Edmonton. For further particulars refer to an advertisement in this issue.

OCTOBER 10.—**Baglan.**—SHOOTING RANGE.—3rd Glamorgan Volunteer Rifle Corps invite tenders for the construction of a rifle shooting range at Baglan, Briton Ferry. Plans, specification, and bill of quantities may be inspected and copied at the Neath Drill Hall up to September 25, afterwards to October 9 at the Swansea Drill Hall.

OCTOBER 11.—**Ferndale.**—INSTITUTE PREMISES.—Tenders are invited for the erection of a swimming bath, hall to seat 1,500, institute, and library at Ferndale for the committee of the Workmen's institute, Ferndale. Plans and specifications may be seen at the office of Mr. T. E. Richards, A.R.I.B.A., Market-square-chambers, Pontypridd, and at present institute, High-street, Ferndale. Quantities will be supplied by the architect after the 23rd inst. upon receipt of a deposit of 3*l.* 3s.

OCTOBER 12.—**Haltwhistle.**—CHURCH HALL.—Tenders are invited (whole or part) for the erection of a church hall, class room, caretaker's rooms, etc., in connexion with Haltwhistle Parish Church. Plans and specifications can be seen at Haltwhistle office of Mr. John M. Clark, F.S.I., land agent and surveyor, up to September 26, and at his Hexham office, September 30 to October 5.

* OCTOBER 12.—**Staffordshire.**—SCHOOL, ETC.—The Staffordshire Education Committee invite tenders for new infants' council school at Shelfield, near Walsall, and slight alterations to existing school and a new council school at Short Heath, near Wolverhampton. For further particulars refer to an advertisement in this issue.

* OCTOBER 21.—**Portsmouth.**—PAVILION.—Tenders are invited for the erection, completion, and maintenance in thorough repair for twelve calendar months from the completion. For further particulars see advertisement in this issue.

OCTOBER 25.—**Leiston.**—HIGHER ELEMENTARY SCHOOL.—East Suffolk County Education Committee invite tenders for the erection of a new higher elementary Council school and cookery, laundry, and manual instruction special subjects' centres at Leiston. Drawings, specifications, and form of contract may be seen after October 7 at the office of the Architect, Mr. E. Thos. Johns, Tower-chambers, Ipswich, between the hours of 10 a.m. and 5 p.m., and at the offices of the Education Committee, County Hall, Ipswich, between the hours of 10 a.m. and 4 p.m. (excepting Saturdays). Copy of the bills of quantities may be obtained, together with a form of tender, by depositing with Mr. W. E. Watkins, Secretary, County Hall, Ipswich, before 12 noon on September 14, the sum of 2*l.* (cheques should be made payable to "W. E. Watkins").

NO DATE.—**Argoed.**—MISSION HALL.—For the erection of a mission hall and reading room at Argoed (Mon.) for the Rev. R. W. Roberts. Names to Mr. H. Douglas Blessley, architect and surveyor, 22, Trinity-street, Cardiff.

NO DATE.—**Bisley Camp.**—CLUB HOUSE.—Tenders are required by the council of the Middlesex Rifle Association for the erection of a club house at Bisley Camp. Quantities will be supplied upon receipt of postal orders for 10s. by Mr. C. E. Lancaster Parkinson, A.R.I.B.A., architect and surveyor, 44, Bedford-row, London, W.C.

* NO DATE.—**Gosport.**—MARRIED QUARTERS.—Tenders are invited for the erection of 6 "b" married soldiers' quarters at Fort Monckton, Gosport. For further particulars see advertisement in this issue.

* NO DATE.—**Hants.**—RECEPTION STATION, ETC.—Tenders are invited for the erection of new reception station and mortuary at Bordon Camp, Hants. For further particulars see advertisement in this issue.

NO DATE.—**Leeds.**—ALTERATIONS.—Alteration of the vicarage, 9, Park-square, Leeds, into offices for Mr. W. A. Emsley. Names to Messrs. Mosley, rent collectors, 6, Wormald-row, Leeds, who will supply a copy of quantities.

NO DATE.—**Springwell.**—WORKMEN'S CLUB AND MANAGER'S HOUSE.—For the erection of workmen's club and manager's house at Springwell. Names and addresses, together with a deposit of 1*l.* 1s., to Messrs. Liddle & Browne, architects, Prudential Buildings, Mosley-street, Newcastle, by whom quantities will be supplied.

ENGINEERING, IRON, AND STEEL.

SEPTEMBER 23.—**Walker.**—Newcastle Corporation invite tenders for the supply and fixing of sanitary fittings to the underground public convenience at Church-street, Walker. Particulars of the requirements, with plan and form of tender, can be obtained at the City Engineer's Office, Town Hall, Newcastle-upon-Tyne.

SEPTEMBER 24.—**Chappel.**—BRIDGE.—Lexden and Winstree R.D.C. invite tenders for building in concrete the walls and buttresses for a new bridge at Chappel, also for supplying and fixing the steel girders and ironwork required. Separate tenders for each to be sent in. Plans and specifications can be seen by appointment at the office of Mr. John Ennals, surveyor, Lexden.

SEPTEMBER 24.—**Edinburgh.**—CAST-IRON PIPES, ETC.—Edinburgh and District Water Trustees invite tenders for providing and delivering about 480 tons of dry sand cast-iron pipes, 20-in. and 12-in. diameter, with relative special castings. Copies of the specification and schedule may be obtained at the office of the engineer, Mr. W. A Tait, C.E., 72A, George-street, Edinburgh, on payment of 1*l.*

SEPTEMBER 24.—**Glasgow.**—STEEL RAILS AND FISHPLATES FOR TRAMWAYS.—Glasgow Corporation invite tenders for the supply of 2,000 tons of rails B.S. section, No. 5, and 25 tons fishplates for same. Specification, with form of tender and drawings, can be obtained on application to Mr. James Dalrymple, General Manager, 46, Bath-street, Glasgow.

SEPTEMBER 26.—**Porth.**—BRIDGE.—Rhondda U.D.C. invite tenders for: (1) the excavation and concrete work in building piers, and (2) the supply, delivery, and erection of about 12 tons steelwork and 2 tons cast iron for the Cymmer Bridge, Porth. Plans and form of tender may be obtained on payment of a deposit of 1*l.* 1s. Particulars to be obtained from Mr. W. J. Jones, engineer and surveyor, Council Offices, Pentre, Rhondda.

SEPTEMBER 30.—**Whitefield.**—BACTERIA BEDS' SPRINKLERS, ETC.—Whitefield U.D.C. invite tenders for No. 2 sprinklers, fittings, etc., for bacteria beds, 85 ft. diameter, required at their Sewage Disposal Works. Plans may be seen, and full particulars and specification obtained, at the office of Mr. C. H. Wright, C.E., Surveyor to the Council, Elms-street, Whitefield, Lancs., upon a deposit of 1*l.*

SEPTEMBER 30.—**Woodside, N.B.**—BRIDGE REPAIRS.—Directors of the Caledonian Railway Company invite tenders for the work to be executed in the renewal of the superstructure of the underbridge on the main line at 165 miles, 40 chains, near Woodside. Drawings may be seen on and after September 23 at the office of the company's district engineer, general station, Perth, where copies of the specification and schedule may be obtained on payment of 2*l.* 2s.

OCTOBER 1.—**Braintree.**—FENCING.—Braintree Joint Hospital Board invite tenders for supplying and fixing boundary fencing at their Small-pox Hospital, Black Notley, Braintree, Essex. Specifications and all particulars can be obtained from the Board's Surveyor, Mr. E. H. Bright, Dodd's Hall, Braintree.

OCTOBER 1.—**Winnipeg, Canada.**—HYDRO-ELECTRIC EQUIPMENT.—The Chairman of the Board of Control, Winnipeg, Canada, invites tenders for the construction of the general works, and for the supply and erection of the various portions of the equipments for the hydro-electric works and station at Point du Bois, for a transmission line between Point du Bois and Winnipeg, and for a receiving transformer station in Winnipeg. Copies of the instructions to bidders, plans, specifications, and forms of tender may be obtained at the Power Engineer's Office, Carnegie Library Building, Winnipeg, or may be examined at the offices of *Engineering*, 35 and 36, Bedford-street, Strand, London, W.C.

OCTOBER 2. **Morecambe.**—STRENGTHENING JETTY, ETC.—The Morecambe (Regent-road) West End Pier Company, Ltd., invite tenders for the strengthening a portion of the existing jetty and building a new head. Contract No. 1.—Iron and steel work. Contract No. 1a.—Carpenters' and joiners' work. Forms of tender and plans may be seen by appointment with Mr. Thomas Dryden, M.Inst.M.E., Grimshaw-street, Preston, from whom specification, quantities, and drawings may be obtained on payment of 2*l.* 2s., 1*l.* 1s. of which will be returned.

OCTOBER 7. — **Cramlington.** — WROUGHT IRON FENCING.—Cramlington U.D.C. invite tenders for the erection of wrought iron fencing and other works at the new cemetery. Plans, conditions, and specifications may be seen at the office of Mr. R. S. Kell, rate collector, Cramlington, to September 28, and afterwards at the office of Mr. W. J. Coulson, Surveyor to the U.D.C., Cramlington, from noon on Monday, September 30, to noon on Saturday, October 5, 1907.

OCTOBER 19. — **Stacksteads.** — BRIDGE RECONSTRUCTION.—Bacup Corporation invite tenders for the reconstruction, widening, and improvement of the bridge carrying the Blackwood-road over the river Irwell at Stacksteads. Plans may be seen and specifications and quantities obtained on application to Mr. W. H. Elce, A.M.Inst.C.E., Borough Engineer, and payment of 1*l.* 1s.

NO DATE.—**St. Anns.**—IRON COTTAGES.—Tenders are invited for building a pair of iron cottages, all materials to be placed on the ground. Plans and specifications to be seen by applying to Mr. J. Roberts, St. Anns, Hatt, Cornwall.

MISCELLANEOUS.

✱ SEPTEMBER 19.—**Herts.**—LIME TANKS, ETC.—The Guardians of St. Pancras invite tenders for the supply and fixing lime tanks, steam pipes, reducing valve, etc., at the schools of this parish at Watford, Herts. For further particulars see advertisement in this issue.

SEPTEMBER 23.—**Burscough.**—FURNISHING, ETC., COUNCIL OFFICES.—Lathom and Burscough U.D.C. invite tenders for the furnishing and fitting up of their new Council Offices at Burscough Bridge, in accordance with specification, which may be obtained on application to the Surveyor, Surveyor's Office, Stanley Institute, Burscough.

SEPTEMBER 23.—**Porth.**—SCAVENGING.—Rhondda U.D.C. invite tenders for the scavenging of Porth for a term of six or twelve months. Specification and form of tender may be obtained at the Surveyor's Office, Council Offices, Pentre.

SEPTEMBER 23.—**Togston.**—SCAVENGING.—Alnwick R.D.C. invite tenders for cleaning out all the ashpits in the township of Togston for twelve months. A copy of the list of duties may be obtained upon application to Mr. H. W. Walton, Clerk, Alnwick.

✱ SEPTEMBER 24.—**Edmonton.**—PORTLAND CEMENT.—The Edmonton U.D.C. invite tenders for supply and delivery of Portland cement. For further particulars refer to an advertisement in this issue.

SEPTEMBER 24.—**Glasgow.**—GAS METERS.—Glasgow Corporation invite tenders for the supply of meters (prepayment and ordinary). Forms of tender may be had on application to Mr. Alex. Wilson, the gas engineer, at his office, 45, John-street, Glasgow.

SEPTEMBER 25.—**Dorchester.**—TIMBER.—Bath and West and Southern Counties Society invite tenders for supplying the timber for the showyard buildings. Specifications may be obtained of the secretary, Mr. Thos. F. Plowman, 3, Pierrepont-street, Bath.

OCTOBER 1.—**Leek.**—REMOVAL OF HOUSE REFUSE.—Leek R.D.C. invite tenders for the removal of night-soil, ashes, and other house refuse in the parish of Endon and Stanley for a period of one year. Form of tender and specification may be obtained on application to Mr. J. Morris Shaw, Clerk, Union Offices, 6, Russell-street, Leek.

OCTOBER 2.—**Littlehampton.**—STEAM ROLLING.—Littlehampton U.D.C. invite tenders for steam rolling of roads in the council's district. Form of tender can be obtained on application to the Council's surveyor, Mr. H. Howard, F.S.I., Town Offices, Littlehampton.

OCTOBER 2.—**Molescroft.**—WELL SINKING.—Beverley Corporation invite tenders for sinking, boring, and steining well and driving adits from the same, together with a line of 10-in. cast iron delivery main, to be laid and jointed. The well is located in the parish of Molescroft, in the East Riding of the county of York, near the Pighill Crossing of the North-Eastern Railway, Market Weighton and Beverley branch. Plans and specification of the work may be seen and the form of tender obtained at the office of Mr. Baldwin Latham, M.Inst.C.E., Parliament Mansions, Victoria-street, Westminster, the engineer for the works, or on application to Mr J. Willis Mills, Town Clerk, 31, Lairgate, Beverley. The quantities of the several works have been taken out, and may be had on application either to the engineer or the Town Clerk on deposit of 5*l.*

NOVEMBER 2. — **Portrush.** — LIGHTING.—Portrush U.D.C. invite tenders for a complete lighting installation by means of either electricity or gas. Specifications prepared by Mr. John Woodside, A.M.Inst.E.E., Ocean Buildings, Belfast, can be seen at the office of Council, Town Hall, Portrush.

PAINTING, etc.

SEPTEMBER 24.—**Brighton.**—PAINTING.—Brighton Guardians invite tenders for painting the external and internal of the parochial offices, Prince's-street, Brighton. Copy of specification, conditions of contract, form of tender, together with all information, may be obtained on application to Mr. E. Wright, Surveyor for the Guardians, Parochial Offices, Prince's-street, Brighton.

ROADS, SANITARY, AND WATER WORKS.

SEPTEMBER 23.—**Baildon.**—DRAINAGE.—Tenders are invited for the drainage of Baildon Hall, comprising over 200 yards of 4-in., 6-in., and 9-in. sewers, manholes, etc. Apply to Messrs. W. B. Woodhead and Sons, surveyors, 18, Exchange-buildings, Bradford.

SEPTEMBER 23.—**Exeter.**—NEW ROAD AND SEWER.—Tenders are invited for the construction of about 500 ft. run of new road and the laying of about 1,450 ft. of sewer on the Streatham Hall Building Estate. Plans and specifications may be seen and bills of quantities obtained at the offices of Messrs. Ellis, Son, & Bowden, F.S.I., surveyors and architects, Bedford Chambers, Exeter.

SEPTEMBER 23.—**Halifax.**—PRIVATE IMPROVEMENT WORKS.—Highways Committee of the Halifax Corporation invite tenders for the execution of private improvement works in Back Heath-crescent. Plans and specifications may be seen and forms of tender obtained on application to Mr. James Lord, M.Inst.C.E., Borough Engineer, Town Hall, Halifax, upon payment of 1*l.*

SEPTEMBER 23.—**Plymouth.**—ROAD WORKS.—Plymouth Corporation invite tenders for making-up and completing Limetree-road-lane and Western College-road. Plans and specifications and conditions may be seen at the offices of Mr. James Paton, Borough Engineer, Municipal Offices, Plymouth, where bills of quantities may also be obtained.

SEPTEMBER 23.—**Stubbington.**—DRAINAGE.—Fareham R.D.C. invite tenders for providing and laying about 549 ft. of 6-in. stoneware pipe drain, with manholes, etc., at Stubbington, Crofton, Hants. Plans and specifications can be seen at the offices of Mr. Graham Whitlock, Clerk to the Council, Union Offices, West-street, Fareham, between 10 a.m. and 5 p.m. up to the 21st inst. (Saturday, 10 a.m. to 1 p.m.).

SEPTEMBER 24.—**Frinton-on-Sea.**—CARRIAGEWAY, ETC.—Frinton-on-Sea U.D.C. invite tenders for sewering and forming a carriageway in Pole Barn-lane, including about 1,000 yds. of sewers, varying in diameter from 12 in. to 6 in., with the usual sewer appurtenances. Carriageway is nearly 8,000 yds. super. Also for the construction of an underground convenience. Bills of quantities and forms of tender may be obtained and the general conditions, specifications, and drawings inspected on application to Mr. E. M. Bate, Surveyor to the Council, at the Council Offices, Frinton-on-Sea, on payment of 2l.. 2s. for both or either set.

✱ SEPTEMBER 24. — **Harlesden.** — ROAD-MAKING. — The Willesden U.D.C. invite tenders for the execution of certain road-making and paving works in Wrottesley-road, Selbon-avenue, and Springwell-avenue, Harlesden. For further particulars see advertisement in this issue.

SEPTEMBER 24. — **Tamworth.** — PRIVATE STREET WORKS.—Tamworth T.C. invite tenders for the kerbing, channelling, paving, metalling, making-up, etc., of a part of Ludgate-street. Plans and specification can be seen and forms of tender obtained from Mr. F. E. G. Bradshaw, Borough Surveyor, Municipal Offices, Tamworth.

SEPTEMBER 25.—**Enfield.**—MAKING-UP ROAD.—Enfield U.D.C. invite tenders for the making-up of the road known as Ferndale-road, Enfield Lock. Plans and specifications can be seen, forms of tender and all information obtained, on application to Mr. Richard Collins, the Council's Surveyor, Public Offices, Enfield, Middlesex, any day except Saturday between 9 a.m. and 5 p.m.

SEPTEMBER 25.—**Hull.**—PAVING, ETC.—Hull Corporation invite tenders for paving, drainage, etc., to be executed in Patrick-lane and in a backway on the west side of Albert-avenue. Forms of tender and other particulars may be obtained at the office of Mr. A. E. White, M.Inst.C.E., City Engineer, Town Hall, Hull.

SEPTEMBER 25.—**Pelaw.**—KERBING, ETC.—Felling U.D.C. invite tenders for the kerbing, concreting, etc., of certain streets at Pelaw. Plans and specifications may be seen at the office of the Surveyor, Council Buildings, Felling, R.S.O., any morning between 9.30 and 10.30.

SEPTEMBER 25.—**Twickenham.**—STREET WORKS.—Twickenham U.D.C. invite tenders for the works in connexion with the sewering, forming, levelling, kerbing, etc., of a new street situated between Lion-road and Station-road. The plan and specification can be seen and quantities and form of tender obtained on application at the office of Mr. Fred W. Pearce, F.S.I., Surveyor to the Council, Town Hall, Twickenham, and payment of 1*l.* 1s.

SEPTEMBER 27.—**East Taphouse.**—SEWER.—Liskeard R.D.C. invite tenders for laying about 425 ft. of new 6-in. stoneware pipe sewer at East Taphouse, in the parish of St. Pinnock. Attendance will be given on September 23 at 3 p.m. to show intending contractors the proposed work. Edwin Mallett, sanitary inspector, Pendruffle, Duloe, R.S.O.

SEPTEMBER 30.—**Tring.**—SEWERAGE.—Tring U.D.C. invite tenders for the provision, laying, and jointing of about 6,500 yds. of stoneware pipe sewers, together with manholes, etc. Drawing and specification may be seen and bills of quantities and form of tender obtained at the offices of the engineers, Messrs. Willcox & Raikes, 63, Temple-row, Birmingham, on payment of a deposit of 3*l.* 3s.

OCTOBER 1. — **Blackrock.** — SEWER. — Blackrock U.D.C. invite tenders for the construction of a sewer in Westfield Valley, length about 200 yds., diameter of pipe, 9 in. Plans and specifications can be seen and full particulars obtained at the Town Hall, Blackrock, Co. Dublin.

OCTOBER 1. — **Ealing.** — SURFACE-WATER SEWER.—Ealing T.C. invite tenders for the construction of new surface-water sewer in the Uxbridge-road, from the river Brent to Kensington Cemetery, with manholes, etc. Drawings and specification may be seen, and forms of tender, together with schedule of quantities and other particulars, obtained from Mr. Charles Jones, M.Inst.C., Borough Engineer, Town Hall, Ealing, W., any day during office hours upon payment of a deposit of 3*l.* 3s.

OCTOBER 1.—**Leeds.**—PAVING AND FLAGGING.—Highways Committee invite tenders for the paving and flagging of various streets. Drawings may be seen at the City Engineer's office, Municipal Buildings. Forms of tender and bills of quantities may be obtained, and copies of the documents forming the contract inspected, on application at the Highways Office, 155, Kirkstall-road, Leeds.

✱ OCTOBER 2. — **Tooting.** — PAVING, ETC. — The Metropolitan Asylums Board invite tenders for the paving, ventilating, etc., of the pipe subway at the Fountain Fever Hospital. For further particulars see advertisement in this issue.

OCTOBER 3.—**Carlow.**—DRAINAGE, WATER SUPPLY, ETC.—Carlow Guardians invite tenders for the carrying out of a system of drainage, sewage disposal, high-pressure water supply, plumbing, the erection of eight sanitary annexes, conversion of existing privies and sanitary accommodation, etc., at the Carlow Workhouse, in accordance with plans and specifications prepared by Mr James O'Donnell, A.M.Inst.C.E., Engineer to the Board of Guardians. Forms of tender, etc., and copies of bills of quantities (the latter prepared by Mr. Geo. Metcalfe, College Park Chambers, Nassau-street, Dublin) can be obtained on payment of 3*l.* 3s. from Mr. Thos. F. Coyle, Clerk of the Union, Clerk's Office, Workhouse, Carlow.

OCTOBER 3. — **Southend-on-Sea.** — MAKING-UP ROAD.—Southend-on-Sea Corporation invite tenders for the making-up of part of Glenwood-avenue. Plans, sections, and specifications may be seen and bills of quantities obtained on deposit of cheque for 1*l.* 1s., upon application to Mr. E. J. Elford, M.I.M.E., Borough Engineer.

OCTOBER 11.—**Bournemouth.**—SEWER.—Tenders are invited for new sewer, Lorne Park. Full particulars, forms of tenders, specifications, and schedules can be obtained of the Borough Engineer, Mr. F. W. Lacey, at whose office drawings can be seen on deposit of 1*l.* 1s.

NO DATE.—**Redditch.**—PATHS, DRAINING, ETC.—Tenders are invited for laying out paths and draining the Redditch cemetery extension. The plans and specifications may be inspected at the offices of Messrs Neasom and White, surveyors, Church-road, Redditch.

STONE, MATERIALS, AND STORES.

SEPTEMBER 23.—**Gelligaer and Rhigos.**—LIMESTONE.—Gelligaer and Rhigos R.D.C. invite tenders for supplying broken limestone (2-in. gauge) and gravel. Specification and form of tender may be obtained upon application to Mr. James P. Jones, Surveyor, Council Offices, Hengoed.

SEPTEMBER 24.—**Cowes.**—PORTLAND CEMENT.—Cowes U.D.C. invite tenders for the supply and delivery of Portland cement. Further particulars and form of tender may be obtained upon application to Mr. John W. Webster, Surveyor and Water Engineer to the Council, High-street, Cowes, I.W.

SEPTEMBER 24. — **Edmonton.**—GRANITE.—Edmonton U.D.C. invite tenders for the supply of blue Guernsey and Aberdeen granite. Forms of tender and full particulars may be obtained of Mr. G. Eedes Eachus, Engineer to the Council, Town Hall, Edmonton.

SEPTEMBER 24.—**Edmonton.**—STONEWARE PIPES.—Edmonton U.D.C. invite tenders for the supply and delivery of stoneware pipes. Forms of tender and full particulars may be obtained on application to Mr. G. Eedes Eachus, Engineer to the Council, Town Hall, Edmonton.

SEPTEMBER 24.—**Glasgow.**—STORES, ETC.—Glasgow Corporation invite tenders for stores for the gas department, and also for cartage. Specifications and forms of tender may be obtained, and samples examined, on application to Mr. Alex. Wilson, the gas engineer, at his office, 45, John-street, Glasgow.

SEPTEMBER 25.—**Hove.**—FLINTS.—Tenders are invited for supplying 2,100 cubic yds. of broken Coombe Rock flints, delivered at Hove Park. Further particulars may be obtained at the office of the Borough Surveyor (Mr. H. H. Scott), Town Hall, Hove.

SEPTEMBER 26.—**Grays.**—MACADAM.—Grays Thurrock U.D.C. invite tenders for the supply and delivery to the Town Wharf, Grays, of 500 tons or thereabouts of 1½-in. granite or basalt macadam and 150 tons of ½-in. chippings of the same material. Form to be obtained with specification from the Council's Surveyor, at his office, High-street, Grays.

SEPTEMBER 28. — **Saffron Walden.** — GRANITE MACADAM.—Saffron Walden Corporation invite tenders for the supply and delivery at Saffron Walden Railway Station of about 500 tons of granite macadam broken to 1¾-in. gauge. Particulars may be obtained from Mr. A. H. Forbes, Borough Surveyor.

SEPTEMBER 30.—**Sandgate.**—HIGHWAY MATERIALS.—Sandgate U.D.C. invite tenders for the supply of highway materials. Forms of tender may be obtained on application to Mr J. Shera Atkinson, Clerk to the Council, Council Offices, 51, High-street, Sandgate, Kent.

SEPTEMBER 30.—**Sevenoaks.**—GRANITE OR QUARTZITE.—Sevenoaks U.D.C. invite tenders for the supply of 465 yds. cube, more or less, of granite or quartzite broken to a gauge of 2 in. Forms of tender, with specification and conditions, may be obtained of Mr. Samuel Towlson, A.M.Inst.C.E., Surveyor to the Council, at his office, Argyle-road, Sevenoaks.

SEPTEMBER 30.—**Tamworth.**—BROKEN GRANITE.—Tamworth R.D.C. invite tenders for the supply of about 2,500 tons of broken granite. Tender form to be obtained at the office of Mr. Henry J. Clarson, C.E., Surveyor, 22, Church-street, Tamworth.

SEPTEMBER 30.—**Whitefield.**—DRAIN TILES.—Whitefield U.D.C. invite tenders for the drain tiles required for No. 2 bacteria beds, 85 ft. in diameter. Plans

may be seen, and the necessary information obtained, from Mr. C. H. Wright, C.E., Surveyor to the Council, Elms-street, Whitefield, Lancs.

OCTOBER 2.—**Clacton.**—CLAY PIT FLINTS OR PIT BALLAST.—Clacton U.D.C. invite tenders for the supply of 1,700 yds. of clay pit flints or pit ballast. Specification and further particulars may be obtained upon application to Mr. A. R. Robinson, Surveyor to the Council, Town Hall, Clacton-on-Sea.

* OCTOBER 7.—**London.**—STORES, ETC.—The Directors of the Metropolitan Railway Company invite tenders for the supply of general stores for twelve months ending October 31, 1908. For further particulars see advertisement in this issue.

OCTOBER 9.—**Haslingden.**—GRANITE SETTS.—Haslingden T.C. invite tenders for the supply of about 2,000 tons of Penmaenmawr granite setts and about 1,000 tons of Pwllheli granite setts, delivered at Haslingden and Baxenden Stations. Specifications may be obtained on application to Mr. J. Singleton Green, Borough Surveyor.

Public Appointments.

Nature of Appointment.	By whom Advertised.	Salary.	Application to be in
*CLERK OF WORKS	Gvrs., H. Schl. Girls, Barnsley	3*l.*	Sept. 25
*INSTRUCTORS IN MANUAL TRAINING	London County Council	100*l.*	Sept. 30

Auction Sales.

Nature and Place of Sale.	By whom Offered.	Date of Sale.
*BUILDERS' MERCHANT'S STOCK, ETC.—379, Green-lanes, Finsbury-park, N.	H. W. Smith	Sept. 23
*BUILDER'S PLANT AND FURNITURE, WEST KENSINGTON—On the Premises	John W. Morley & Co.	Sept. 24
*DEALS, BATTENS, ETC.—Great Hall, Winchester House, Old Broad-street, E.C.	Churchill & Sims	Sept. 25
*BUILDERS' MERCHANT'S STOCK, WALTHAMSTOW—On the Premises	Henry W. Figg & Son	Sept. 26
*BUILDING SITE, CITY OF LONDON—At the Mart	Norton, Trist, & Gilbert	Oct. 9
*FREEHOLD BUILDING SITE, HATTON-GARDEN—At the Mart	S. Walker & Son	Oct. 15
*BUILDING LEASE, 20 TO 23, HOLBORN, E.C.—At the Mart	Daniel Watney & Sons	Oct. 17

PATENTS.—*Continued from page 322.*

27,203 of 1906.—M. S. SALTER: *Appliances used in Connexion with Lavatory and like Doors, having Coin Freed or Registering Locks.*

This relates to means for securing lavatory and like doors in partly-closed position, and consists of a fixed rachet or equivalent, a tumbler or pawl on the door adapted to engage the ratchet, and means for reversing the tumbler at each end of the ratchet, so that the door, when brought into engagement, cannot be reopened until it has first been fully closed.

27,590 of 1906.—J. FERGUSON: *Appliances for use in the Construction of Concrete or Similar Floors and Roofs.*

This relates to a centring comprising an extensible twin bar for use in the construction of concrete or similar floors and roofs, and comprises the combination with the outer heads of said twin bars of bearing plates adapted for vertical and longitudinal adjustment.

28,151 of 1906.—THE CAMELON IRON COMPANY, LTD., and J. HENRY: *Domestic Fireplaces.*

This consists in the connexion with a domestic fireplace of a canopy blower and damper, so combined that the damper may be operated either on the movement of the canopy and blower together, or on the movement of the blower alone.

29,504 of 1906.—M. RAMOS-GARCIA: *Paints for Buildings.*

This relates to a method of manufacturing a product to be used for painting buildings which consists in treating zincate of ammonium (obtained by the action of aqueous ammonia upon oxide of zinc) with antimonic acid and aluminium hydrate, preferably with the addition of carbon disulphide, whereby a double zincate of aluminium and antimony is obtained.

629 of 1907.—A. A. GERY: *Drying and Burning Bricks and the like.*

This relates to the manufacture of bricks or the like, and consists in partitioning off a part of a tunnel in such manner that the bricks which are to be passed through the tunnel are first of all treated in this part of the tunnel, which constitutes a drying chamber, by the action of inforced air, which is maintained in said chamber under compression while passing therethrough.

990 of 1907.—H. C. FARRELL and L. BROWN: *Valves.*

This relates to a valve in which the stopper is spherical or ball-shaped, and comprises means for connecting the ball and stem, comprising a head formed on the end of the valve stem and consisting of a ring bearing against a shoulder on the back of the head, and a number of integral jaws extending forwardly from the ring and bent inwardly so as to engage the ball.

1,353 of 1907.—COMYN CHING & CO., LTD., and W. THWAITES: *Ventilators.*

This relates to an adjustable ventilator for a window pane or glass panel, comprising a solid circular glass disc mounted at the inner end of a spindle adapted to a screw through a boss mounted concentrically in a circulating ventilating aperture provided in the pane or panel, a flanged metal ring provided with a spider for supporting the boss, means for securing it to the window pane, and a pulley-wheel for enabling the spindle to be rotated in either direction by an endless chord so as to cause the disc to close or open said aperture at will.

4,019 of 1907.—L. G. LEFFER: *Flushing or Water-supply Cistern.*

This relates to a flushing or water-supply cistern wherein a movable outlet pipe is coupled to the float by means of a locking device in such manner that after disengaging the coupling, by means of a pull from the outside, the outlet pipe is lowered, and that upon the water level decreasing and the float lowering a connexion is again established by a sliding and locking of the coupling part attached to the float, whereby on the inflow of water the outlet pipe is again raised by the float and returned to its former position.

9,360 of 1907.—A. E. MILLER: *Gate Mechanism.*

This relates to a gate-controlling mechanism, comprising a vertical shaft, a rock shaft extending parallel to the roadway and geared to the first shaft for actuating the same, a swinging gate, a latch for locking the gate, a spring arranged to move the latch to its closed position, a crank on the vertical shaft, a pitman attached at one end to the crank and arranged to engage at the other end the latch for moving the latter to its open position, and means for mounting the gate on the vertical shaft so as to cause the rotation of the latter to first unlock the latch and then swing the gate open.

12,452 of 1907.—IDEAL CONCRETE MACHINERY COMPANY: *Building Block Moulding Machines.*

This relates to a building block moulding machine in which the block is made with its face down, and in which the parts are so arranged that the block may be delivered with the face vertical, and comprises the combination of a supporting frame and a mould, the rear side of the mould being independently mounted, the front side and bottom of the mould being adapted to swing outwardly together with the moulded block to carry the block to discharging position, and cores operated by a lever mounted on an axis carrying a yoke piece connected by links pivoted to said cores so as to move same horizontally through openings in the rear side plate of the mould.

26,352 of 1906.—A. HIRST and B. HIRST: *Blades for Sawing Stone, Metal, or the like.*

This relates to a blade for sawing stone, metal, or the like, having flat-bottomed or square-cut grooves or recesses rolled alternately in each face or side thereof from edge to edge of the blade with a central section or backbone and a full thickness of metal between each groove and between the groove or grooves on one side and the neighbouring grooves on the opposite side, the width or length of the full thickness of metal between the grooves being about equal to the width of the grooves.

TERMS OF SUBSCRIPTION.

"THE BUILDER" (Published Weekly) is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum, and Canada 21s. 8d. (52 numbers) PREPAID. To all parts of Europe, America, Australia, New Zealand, India, China, Ceylon, etc., 26s. per annum.

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SUBSCRIBERS in LONDON and the SUBURBS, by prepaying at the Publishing Office 19s. per annum (52 numbers) or 4s. 9d. per quarter (13 numbers), can ensure receiving "The Builder" by *Friday Morning's Post.*

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

September 2.—By T. V. PRICE (at Bulith Wells).

Llandilo-Graban, Radnor.—Pentryncoch, house and gardens, f.	£185

September 4.—By MADDISON, MILES, & MADDISON (at Great Yarmouth).

Rollesby, Norfolk.—Fruit Farm, 10 a. 2 r. 35 p., f. and c.	700
Caister-on-Sea, Norfolk.—West Caister-rd., The White House, f.	746
Blundeston, Suffolk.—Yarmouth-rd, freehold cottage	198

September 6.—By LANGRIDGE & FREEMAN (at Tunbridge Wells).

Tunbridge Wells.—The Down-la. Football Ground, 2¼ acres, f.	2,010
The Down Farm Homestead, 3 acres, f.	1,500

September 9.—By KNIGHT, FRANK, & RUTLEY.

Hockley, Essex.—Lovedown's Farm, 119 a. 1 r. 37 p., f., y.r. 92*l.* 10s.	1,600

By ALFRED MANSELL & CO. (at Llanymynech).

Kinnerley, Salop.—Portion of the Pentre Perva Farm, 18 a. 1 r. 30 p., f.	740

By RICHARDSON & SON (at Selby).

Burn, Yorks.—The Burn Hall Farm, 199 a. 2 r. 5 p., f.	5,650
The Top House Farm, 116 a. 2 r. 13 p., f.	3,450

September 10.—By HARRY H. ARNOLD.

Stalham, etc., Norfolk.—The North Walsham and Dilham Canal, f., yearly income 400*l.*	2,550
Dilham, Norfolk.—House and Land 2 a. 1 r. 20 p., f.	280
North Walsham, Norfolk.—Bacton Wood Staithe (Granaries), f.	340
Edingthorpe, Norfolk.—Water Corn Mill, residence, etc., 2 a. 1 r. 18 p., f.	550
High-rd., arable and pasture land, 8 a. 0 r. 3 p., f.	235
Smallburgh, Norfolk.—High-rd., Wayford Bridge Granaries, f.	400

By J. W. TRUMAN.

Shepherd's Bush.—23, Rylett-rd., u.t. 70 yrs., g.r. 11*l.*, e.r. 55*l.*	450

By W. H. ROBINSON (at Manchester).

Romiley, Cheshire.—Oakwood Hall and Hyde Bank Farm, 111 a. 0 r. 28 p., f.	5,710
Church-la., l.g.r. 57*l.* 3s., u.t. 873 yrs., g.r. 4*l.*	1,080
Hyde Bank-la., etc., Perpetual Freehold Chief Rents 126*l.*	2,670

By MESSRS. COBB (at Rochester).

Cliffe, Kent.—Cots Sole farm and enclosures of pasture land, 70 a. 3 r. 6 p., f.	3,175

September 11.—By ARMSTRONG & SON (at Wootton Bassett).

Broadtown, Wilts.—Barnhill Farm, 80 a. 2 r. 25 p., f.	2,450
Wootton Bassett, Wilts.—Bushey Vowley Farm, 198 a. 3 r. 13 p., f.	3,450

September 12.—By ROGERS BROS.

Peckham.—22, New James-st., f., w.r. 28*l.* 12s.	£190
Bermondsey.—31. 33, and 35, Rolls-rd., u.t. 39 yrs., g.r. 15*l.*, w.r. 141*l.* 14s.	580
Sydenham.—1 to 6, Crown-pl., u.t. 51 yrs., g.r. 15*l.*, w.r. 101*l.* 8s.	400

Contractions used in this list.—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; p. for possession; e.r. for estimated rental; w.r. for weekly rental; q.r. for quarterly rental; y.r. for yearly rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; la. for lane; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; av. for avenue; gdns. for gardens; yd. for yard; gr. for grove; b.h. for beerhouse; p.h. for public-house; o. for office; s. for shops; ct. for court.

MEETINGS.

FRIDAY, SEPTEMBER 20.

Royal Sanitary Institute.—Dr. J. Priestley on "Sanitary Law." 7 p.m.

SATURDAY, SEPTEMBER 21.

Royal Sanitary Institute.—Inspection and demonstration at Wimbledon Sewage Works at about 2.45 p.m.

MONDAY, SEPTEMBER 23.

Royal Sanitary Institute.—Dr. A. Wellesley Harris on "Duties of a Sanitary Inspector." 7 p.m.

THURSDAY, SEPTEMBER 26.

Junior Institution of Engineers.—Visit at 3.30 p.m. the Engineering and Machinery Exhibition at Olympia.

Royal Sanitary Institute.—Dr. A. Wellesley Harris on "Duties of a Sanitary Inspector." 7 p.m.

FRIDAY, SEPTEMBER 27.

Royal Sanitary Institute.—Dr. A. Wellesley Harris on "Duties of a Sanitary Inspector." 7 p.m.

PRICES CURRENT OF MATERIALS.

*** Our aim in this list is to give, as far as possible, the *average* prices of materials, not necessarily the lowest. Quality and quantity obviously affect prices—a fact which should be remembered by those who make use of this information.

BRICKS, &c.

	£ s. d.	
Hard Stocks	1 7 0	per 1000 alongside, in river.
Rough Stocks and Grizzles	1 6 0	" " "
Picked Stocks for Facings	2 10 0	" delivered.
Flettons	1 6 0	" at railway depôt.
Red Wire Cuts	1 14 0	" " "
Best Fareham Red	3 12 0	" " "
Best Red Pressed Ruabon Facing	5 0 0	" " "
Best Blue Pressed Staffordshire	3 15 0	" " "
Do. Bullnose	4 0 0	" " "
Best Stourbridge Fire Bricks	3 14 0	" " "

GLAZED BRICKS.

Best White and Ivory Glazed Stretchers	12 0 0	" " "
Headers	11 0 0	" " "
Quoins, Bullnose, and Flats	16 0 0	" " "
Double Stretchers	19 0 0	" " "
Double Headers	16 0 0	" " "
One Side and two Ends	19 0 0	" " "
Two Sides and one End	20 0 0	" " "
Splays, Chamferred, Squints	20 0 0	" " "
Best Dipped Salt Glazed Stretchers, and Header	12 0 0	" " "
Quoins, Bullnose, and Flats	14 0 0	" " "
Double Stretchers	15 0 0	" " "
Double Headers	14 0 0	" " "
One Side and two Ends	15 0 0	" " "
Two Sides and one End	15 0 0	" " "
Splays, Chamferred, Squints	14 0 0	" " "
Second Quality White and Dipped Salt Glazed	2 0 0	" less than best.

	s. d.	
Thames and Pit Sand	7 0	per yard, delivered.
Thames Ballast	5 6	" "
Best Portland Cement	28 0	per ton, "
Best Ground Blue Lias Lime	19 0	" "

NOTE.—The cement or lime is exclusive of the ordinary charge for sacks.

Grey Stone Lime ..... 11s. 6d. per yard, delivered.
Stourbridge Fireclay in sacks 27s. 0d. per ton at rly. dpt.

STONE.

	s. d.	
BATH STONE—delivered on road waggons, Paddington Depôt	1 6½	per ft. cube.
Do. do. delivered on road waggons, Nine Elms Depôt	1 8½	" "
PORTLAND STONE (20 ft. average)—		
Brown Whitbed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 1	" "
White Basebed, delivered on road waggons, Paddington Depôt, Nine Elms Depôt, or Pimlico Wharf	2 2½	" "
Ancaster in blocks	1 10	per ft. cube, deld. rly. depôt.
Beer "	1 6	" "
Gremshill "	1 10	" "
Darley Dale in blocks	2 4	" "
Red Corsehill "	2 2	" "
Closeburn Red Freestone	2 0	" "
Red Mansfield "	2 4	" "

STONE (*continued*).

YORK STONE—*Robin Hood Quality.*

	s. d.	
Scappled random blocks	2 10	per ft. cube, deld. rly. depôt.
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 3	per ft. super., "
6 in. rubbed two sides ditto, ditto	2 6	" "
3 in. sawn two sides slabs (random sizes)	0 11½	" "
2 in. to 2½ in. sawn one side slabs (random sizes)	0 7½	" "
1½ in. to 2 in. ditto, ditto	0 6	" "
HARD YORK—		
Scappled random blocks	3 0	per ft. cube, "
6 in. sawn two sides landings to sizes (under 40 ft. super.)	2 8	per ft. super., "
6 in. rubbed two sides ditto	3 0	" "
3 in. sawn two sides slabs (random sizes)	1 2	" "
2 in. self-faced random flags	0 5	" "

SLATES.

In. In.	£ s. d.	
20×10 best blue Bangor	13 2 6	per 1000 of 1200 at r. d.
20×12 " "	13 17 6	" "
20×10 first quality "	13 0 0	" "
20×12 " "	13 15 0	" "
16×8 " "	7 5 0	" "
20×10 best blue Portmadoc	12 12 6	" "
16×8 " "	6 12 6	" "
20×10 best Eureka unfading green	15 17 6	" "
20×12 " "	18 7 6	" "
18×10 " "	13 5 0	" "
16×8 " "	10 5 0	" "
20×10 permanent green	11 12 6	" "
18×10 " "	9 12 6	" "
16×8 " "	6 12 6	" "

TILES.

	s. d.	
Best plain red roofing tiles	42 0	per 1000 at rly. depôt.
Hip and Valley tiles	3 7	per doz. "
Best Broseley tiles	50 0	per 1000 "
Do. Ornamental tiles	52 6	" "
Hip and Valley tiles	4 0	per doz. "
Best Ruabon red, brown, or brindled do. (Edwards)	57 6	" "
Do. Ornamental do.	60 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 0	" "
Best Red or Mottled Staffordshire do. (Peakes)	51 9	per 1000 "
Do. Ornamental do.	54 6	" "
Hip tiles	4 1	per doz. "
Valley tiles	3 8	" "
Best "Rosemary" brand plain tiles	48 0	per 1000 "
Best Ornamental tiles	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 8	" "
Best "Hartshill" brand plain tiles, sand-faced	50 0	per 1000 "
Do. pressed	47 6	" "
Do. Ornamental do.	50 0	" "
Hip tiles	4 0	per doz. "
Valley tiles	3 6	" "

WOOD.

BUILDING WOOD.

	£ s. d.		At per standard. £ s. d.
Deals: best 3 in. by 11 in. and 4 in. by 9 in. and 11 in.	13 10 0	...	15 0 0
Deals: best 3 by 9	13 0 0	...	14 0 0
Battens: best 2½ in. by 7 in. and 8 in., and 3 in. by 7 in. and 8 in.	11 0 0	...	12 0 0
Battens: best 2½ by 6 and 3 by 6	0 10 0		less than 7 in. and 8 in.
Deals: seconds	1 0 0		less thn best.
Battens: seconds	0 10 0		" "
3 in. by 4 in. and 2 in. by 6 in.	9 0 0	...	10 0 0
2 in. by 4½ in. and 2 in. by 5 in.	8 10 0	...	9 10 0
Foreign Sawn Boards— 1 in. and 1¼ in. by 7 in.	0 10 0		more than battens.
¾ in.	1 0 0		"

	At per load of 50 ft.		
Fir timber: best middling Danzig or Memel (average specification)	4 10 0	...	5 0 0
Seconds	4 0 0	...	4 10 0
Small timber (8 in. to 10 in.)	3 12 6	...	3 15 0
Small timber (6 in. to 8 in.)	3 0 0	...	3 10 0
Swedish balks	2 10 0	...	3 0 0
Pitch-pine timber (30 ft. average)	4 0 0	...	4 15 0

JOINERS' WOOD.

	At per standard. £ s. d.		£ s. d.
White Sea: first yellow deals, 3 in. by 11 in.	24 0 0	...	25 0 0
3 in. by 9 in.	22 0 0	...	23 0 0
Battens, 2½ in. and 3 in. by 7 in.	16 10 0	...	18 0 0
Second yellow deals, 3 in. by 1 in.	18 10 0	...	20 0 0
" " 3 in. by 9 in.	17 10 0	...	19 0 0
Battens, 2½ in. and 3 in. by 7 in.	13 10 0	...	14 10 0
Third yellow deals, 3 in. by 11 in. and 9 in.	13 10 0	...	15 0 0
Battens, 2½ in. and 3 in. by 7 in.	11 0 0	...	12 0 0
Petersburg first yellow deals, 3 in. by 11 in.	21 0 0	...	22 10 0
Do. 3 in. by 9 in.	18 0 0	...	19 10 0
Battens	13 10 0	...	15 0 0
Second yellow deals, 3in. by 11in.	16 0 0	...	17 0 0
Do. 3 in. by 9 in.	14 10 0	...	16 0 0
Battens	11 0 0	...	12 10 0
Third yellow deals, 3 in. by 11 in.	13 0 0	...	14 0 0
Do. 3 in. by 9 in.	12 10 0	...	14 0 0
Battens	10 0 0	...	11 0 0
White Sea and Petersburg— First white deals, 3 in. by 11 in.	14 10 0	...	15 10 0
" 3 in. by 9 in.	13 10 0	...	14 10 0
Battens	11 0 0	...	12 0 0
Second white deals, 3 in. by 11 in.	13 10 0	...	14 10 0
" " 3 in. by 9 in.	12 10 0	...	13 10 0
" " battens	10 0 0	...	11 0 0

WOOD (*continued*).

JOINERS' WOOD (*continued*)—

	At per standard. £ s. d.		£ s. d.
Pitch pine: deals	18 0 0	...	21 0 0
Under 2 in. thick extra	0 10 0	...	1 0 0
Yellow Pine—First, regular sizes	44 0 0		upwards.
Oddments	32 0 0		"
Seconds, regular sizes	33 0 0		"
Yellow Pine oddments	28 0 0		"
Kauri Pine—Planks, per ft. cube	0 3 6	...	0 5 0
Danzig and Stettin Oak Logs— Large, per ft. cube	0 3 0	...	0 3 6
Small " "	0 2 6	...	0 2 9
Wainscot Oak Logs, per ft. cube	0 5 6	...	0 6 0
Dry Wainscot Oak, per ft. sup. as inch	0 0 8½	...	0 0 9½
¾ in. do. do	0 0 7	...	—
Dry Mahogany—Honduras, Tabasco, per ft. super. as inch	0 0 9	...	0 1 0
Selected, Figury, per ft. super. as inch	0 1 6	...	0 2 6
Dry Walnut, American, per ft. super. as inch	0 0 10	...	0 1 0
Teak, per load	17 0 0	...	22 0 0
American Whitewood Planks, per ft. cube	0 4 0	...	0 5 0

Prepared Flooring, etc.—	Per square.		
1 in. by 7 in. yellow, planed and shot	0 13 6	...	0 17 6
1 in. by 7 in. yellow, planed and matched	0 14 0	...	0 18 0
1¼ in. by 7 in. yellow, planed and matched	0 16 0	...	1 0 0
1 in. by 7 in. white, planed and shot	0 12 0	...	0 14 6
1 in. by 7 in. white, planed and matched	0 12 6	...	0 15 0
1¼ in. by 7 in. white, planed and matched	0 15 0	...	0 16 6
¾ in. by 7 in. yellow, matched and beaded or V-jointed brds.	0 11 0	...	0 13 6
1 in. by 7 in. " "	0 14 0	...	0 18 0
¾ in. by 7 in. white " "	0 10 0	...	0 11 6
1 in. by 7 in. " " "	0 12 9	...	0 15 0

6 in. at 6d. to 9d. per square less than 7 in.

JOISTS, GIRDERS, &c.

	In London, or delivered Railway Vans, per ton. £ s. d.		£ s. d.
Rolled Steel Joists, ordinary sections	7 15 0	...	8 5 0
Compound Girders, ordinary sections	10 0 0	...	11 0 0
Steel Compound Stanchions	12 10 0	...	13 10 0
Angles, Tees, and Channels, ordinary sections	9 15 0	...	10 15 0
Flitch Plates	9 15 0	...	10 15 0
Cast Iron Columns and Stanchions including ordinary patterns	8 0 0	...	9 0 0

METALS.

	Per ton, in London. £ s. d.		£ s. d.
IRON— Common Bars	8 10 0	...	9 0 0
Staffordshire Crown Bars, good merchant quality	9 5 0	...	9 15 0
Staffordshire "Marked Bars"	11 0 0	...	—
Mild Steel Bars	9 10 0	...	9 15 0
Hoop Iron, basis price	9 15 0	...	10 0 0
" " Galvanised	17 10 0	...	—
("And upwards, according to size and gauge.)			
Sheet Iron Black— Ordinary sizes to 20 g.	10 0 0	...	—
" " 24 g.	11 0 0	...	—
" " 26 g.	12 10 0	...	—
Sheet Iron, Galvanised, flat, ordinary quality— Ordinary sizes, 6 ft. by 2 ft. to 3 ft. to 20 g.	16 0 0	...	—
Ordinary sizes to 22 g. and 24 g.	16 10 0	...	—
" " 26 g.	17 0 0	...	—
Sheet Iron, Galvanised, flat, best quality— Ordinary sizes to 20 g.	19 0 0	...	—
" " 22 g. and 24 g.	19 10 0	...	—
" " 26 g.	21 0 0	...	—
Galvanised Corrugated Sheets— Ordinary sizes 6 ft. to 8 ft. 20 g.	16 0 0	...	—
" " 22 g. and 24 g.	16 5 0	...	—
" " 26 g.	17 10 0	...	—
Best Soft Steel Sheets, 6 ft. by 2 ft. to 3 ft. by 20 g. and thicker	13 0 0	...	—
Best Soft Steel Sheets, 22 g. & 24 g.	14 0 0	...	—
" " " 26 g.	16 0 0	...	—
Cut Nails, 3 in. to 6 in.	10 15 0	...	11 5 0

(Under 3 in., usual trade extras.)

LEAD, &c.

	Per ton, in London. £ s. d.		£ s. d.
LEAD—Sheet, English, 3lb. and up.	23 5 0	...	—
Pipe in coils	23 15 0	...	—
Soil pipe	25 15 0	...	—
Compo pipe	26 15 0	...	—
ZINC—Sheet—			—
Vieille Montagne ton	32 10 0	...	—
Silesian	32 5 0	...	
COPPER—			
Strong Sheet per lb.	0 1 4	...	—
Thin " "	0 1 5	...	—
Copper nails "	0 1 3	...	—
BRASS—			
Strong Sheet "	0 1 2	...	—
Thin " "	0 1 3	...	—
TIN—English Ingots "	0 1 10	...	—
SOLDER—Plumbers' "	0 0 9	...	—
Tinmen's "	0 0 11	...	—
Blowpipe "	0 1 1	...	—

ENGLISH SHEET GLASS IN CRATES OF STOCK SIZES.

15 oz. thirds	2½d.	per ft. delivered.
" fourths	1⅝d.	" "
21 oz. thirds	3⅛d.	" "
" fourths	2⅛d.	" "
26 oz. thirds	4¼d.	" "
" fourths	3¼d.	" "
32 oz. thirds	5d.	" "
" fourths	4⅛d.	" "
Fluted Sheet, 15 oz.	3⅛d.	" "
" 21 oz.	4¼d.	" "

ENGLISH ROLLED PLATE IN CRATES OF STOCK SIZES.

¼ Hartley's	2½d.	per ft. delivered.
⅜ "	2¾d.	" "
½ "	3d.	" "
Figured and Oxford Rolled		
"Oceanic" Glass, white ...	4d.	"
Do. " tinted ...	5½d.	" "

OILS, &c.		£	s.	d.
Raw Linseed Oil in pipes	per gallon	0	2	1
" " " in barrels	"	0	2	2
" " " in drums	"	0	2	4
Boiled " " in pipes	"	0	2	3
" " " in barrels	"	0	2	4
" " " in drums	"	0	2	5
Turpentine in barrels	"	0	3	3
" in drums	"	0	3	5
Genuine Ground English White Lead	per ton	26	10	0
Red Lead, Dry	"	25	10	0
Best Linseed Oil Putty	per cwt.	0	7	0
Stockholm Tar	per barrel	1	12	0

VARNISHES, &c.	Per gallon. £	s.	d.
Fine Pale Oak Varnish	0	8	0
Pale Copal Oak	0	10	6
Superfine Pale Elastic Oak	0	12	6
Fine Extra Hard Church Oak	0	10	0
Superfine Hard-drying Oak, for seats of Churches	0	14	0
Fine Elastic Carriage	0	12	6
Superfine Pale Elastic Carriage	0	16	0
Fine Pale Maple	0	16	0
Finest Pale Durable Copal	0	18	0
Extra Pale French Oil	1	1	0
Eggshell Flatting Varnish	0	18	0
White Copal Enamel	1	4	0
Extra Pale Paper	0	12	0
Best Japan Gold Size	0	10	6
Best Black Japan	0	16	0
Oak and Mahogany Stain	0	9	0
Brunswick Black	0	8	6
Berlin Black	0	16	0
Knotting	0	10	0
French and Brush Polish	0	10	0

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PREPAYMENT IS ABSOLUTELY NECESSARY.

"*" Stamps must not be sent, but all sums should be remitted by Postal Orders, payable to J. MORGAN, and addressed to the Publisher of "THE BUILDER," 4, Catherine Street, W.C.

Advertisements for the current week's issue are received up to ONE p.m. on THURSDAY, but "Classification" is impossible in the case of any which may reach the Office after TWELVE NOON on that day. Those intended for the Outside Wrapper should be in by TWELVE NOON on WEDNESDAY.

ALTERATIONS IN STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same must reach the Office before TEN o'clock on WEDNESDAY MORNING.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, etc., left at the Office in reply to advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

ADVERTISERS in "THE BUILDER" may have *Replies addressed to the Office*, 4, Catherine Street, Covent Garden, W.C., *free of charge*. Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage. Unused stamps are returned to advertisers the week after publication.

N.B.—The Reply Boxes are not intended for trade lists, circulars, and the like; should these be received, they cannot (if noticed) be forwarded.

AN EDITION Printed on THIN PAPER, for FOREIGN and COLONIAL CIRCULATION, is issued every week.

READING CASES { NINEPENCE EACH. By post (carefully packed) 1s.

TENDERS.

Communications for insertion under this heading should be addressed to "The Editor," and must reach us *not later than* 10 *a.m. on Thursdays*. [N.B.—We cannot publish Tenders unless authenticated either by the architect or the building-owner; and we cannot publish announcements of Tenders accepted unless the amount of the Tender is stated, nor any list in which the lowest Tender is under 100*l.*, unless in some exceptional cases and for special reasons.]

* Denotes *accepted*. † Denotes *provisionally accepted*.

BERWICK-ON-TWEED.—For erecting a disinfector at the Workhouse, for the Guardians:—
T. A. Sandels, Berwick* £107 10 0

BEVERLEY.—For alterations to Northwood House, for the Governors of the High School for Girls. Mr. B. S. Jacobs, F.R.I.B.A., Lincoln's Inn-buildings, Bowalley-lane, Hull. Quantities by the architect:—

J. Bentley ..	1,463 7 10	G. Pape & Sons	£1,169 0 0
R. Potts	1,261 0 0	W. Sanderson	1,136 6 0
Marsden & Son, Ltd...	1,258 0 0	G. Jackson & Sons, Hull*	1,108 17 6
Bowman & Son	1,190 0 0	F. Singleton	1,104 0 0

BLANIA (Mon).—For erecting 32 cottages. Mr. E. A. Johnson, F.R.I.B.A., Abergavenny:—
A. I. Colborne, Swindon* £5,799 10 0

BLETCHLEY.—For making new streets for Mr. F. Tanqueray. Mr. J. Chadwick, civil engineer, Bletchley, and 53, Victoria-street, Westminster. Quantities by the engineer:—

F. Kilsby	£2,624 0 0
W. Griffiths & Co., Ltd.	2,427 4 7
H. H. Barry	2,366 17 0
T. Watson, jun.	2,239 11 9
Currell, Lewis, & Martin, Ltd.	2 060 0 0
W. J. Jackson	2,040 17 0
Fry Bros.	2,034 0 0
J. C. Truman, Ltd.	2,020 0 0
G. J. Fisher	2,000 0 0
A. F. Lee	1,997 7 0
W. G. Willmott	1,853 0 0
Willis & Powis	1,774 16 7
G. Powdrill	1,769 14 0
T. Yerrell, Leighton Buzzard	1,722 0 0

BOW.—For new offices, drainage, and ventilation at the Council school, for the Devon County Education Committee. Mr. P. Morris, County Architect (Education), Exeter:—

Dart & Francis	£280 0
E. Gillard & Son	250 11
Fisher Bros.	250 2
W. Backwell, Crediton*	213 18

[Architect's estimate, £250.]

BRISTOL.—For the erection of New Entrance Lodge at "The Grove," Stoke Bishop, Bristol. Mr. W. H. Watkins, A.R.I.B.A., Provident-buildings, 15, Clare-street, Bristol:—

G. Humphreys.....	£695	Stephens, Bastow & Co., Ltd.	£619
Neale Bros.	693	C. A. Hayes	569
Cowlin & Son	674		
Walters & Sons	660		

BRISTOL.—For extensions to No. 243, Church-road, St. George. Mr. W. H. Watkins, A.R.I.B.A., Provident-building, 15, Clare-street, Bristol:—
Bartlett & Son £130

BROMLEY.—For erecting showroom and garage, with residential flat over for Mr. J. E. Anthony. Messrs. Dunsmore Bros., architect and surveyors, Honor Oak-park, S.E.:—

J. & C. Bowyer....	£1,598	W. Nash.....	£1,260
W. T. Champion ..	1,420	J. Watt	1,158
J. Arnaud & Son ..	1,419	Gathercole Bros.‡..	1,140

‡ Accepted as modified.

CARSHALTON.—For making up of Blakehall-road, for the Urban District Council. Mr. W. Willis Gale, Surveyor, Council Office, High-street, Carshalton:—

R. W. Swaker	£1,663 9 1
H. Woodhams & Sons	1,272 17 7
F. Hoffman	1,250 18 3½
T. Wood & Sons	1,186 0 4
G. Bell & Sons	1,173 0 0
T. Free & Sons	1,167 4 11
W. Pearce	1,155 12 0
G. W. Adey	1,128 18 9
Potter & Co.	1,077 17 0
T. Adams	1,061 1 6
E. Streeter	1,054 14 11
Chittenden & Simmonds	1,019 6 10
J. May	991 10 0
E. & E. Iles	982 11 7
J. B. Potter, Sutton*	968 14 1

[Surveyor's estimate, £1,100.]

CHADDERTON. — For sewering and completing Bamford-street, Sefton-street, and Industry-street, for the Urban District Council. Mr. A. W. Cox, Surveyor. Quantities by Surveyor:

Bamford-street.

E. Yates	£191 14 9
J. E. Mayall	180 0 0
J. Calcraft & Son	175 0 0
G. Freeman & Sons	172 2 6
R. Heard, Chadderton*	171 5 4

Sefton-street.

J. E. Mayall	£432 0 0
E. Yates	429 8 2
J. Calcraft & Son	425 0 0
R. Heard	411 16 3
G. Freeman & Sons, Chadderton* ..	406 9 11

Industry-street.

E. Yates	£116 17 6
J. E. Mayall	106 0 0
G. Freeman & Sons	102 10 4
R. Heard	100 7 10
J. Calcraft & Son, Oldham*	100 0 0

CHEPPING WYCOMBE.—For surface-water drain, London-road, and reconstruction of bridge, for the Corporation. Mr. T. J. Rushbrooke, Borough Surveyor, High Wycombe:—

J. T. Harris	£62 19	A. D. Lee, High Wycombe*	£59 0

Reconstruction of Bridge over River Wye at Newlands.

J. T. Harris	£579	Langley & Johnson..	£568
A. F. Lee	570	G. H. Gibson, High Wycombe*	500

CHESHAM. — For the erection of a factory at Chesham, Bucks, for Mr. Jesse Wright. Messrs. Stokes, Pinder, & Belch, architects, Chesham, and 49, Upper Baker-street, N.W.:—

A. Wright	£1,546 4 0	G. Darlington	£1,358
G. Darvell	1,532 0 0	Abbott & Son	1,333
H. J. Wright..	1,490 0 0	A. Mead & Son	1,325
F. G. Rust	1,471 4 9	J. Mead, Chesham*	1,288
W. W. Freeman	1,398 0 0		

DARTFORD.—For alterations and extensions of hot-water supply system, cold water, supply mains, etc., at Gore Farm Hospital, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

R. Dawson & Co., Ltd.	£977 0 0
T. Potter & Sons, Ltd.	497 10 0
W. G. Cannon & Sons, Ltd.	490 0 0
Tilley Bros.	489 14 3
Brightside Foundry and Engineering Co., Ltd.	487 0 0
W. F. Spencer	451 0 0
Cannon & Hefford	449 0 0
J. & F. May	445 10 0
Watford Engineering Works, Watford*	415 0 0
W. M. Glendinning	340 0 0

DUFFIELD.—For making up private streets, for the Belper Rural District Council. Mr. Robert C. Condon, Engineer and Surveyor, Duffield, near Derby:—
A. Hingley, Duffield, Derby* £363

DARTFORD (Kent).—For alterations and additions to fire-alarm and telephone systems at the Gore Farm Hospitals, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

Watford Engineering Works	£400 0 0
W. G. Cannon & Sons	375 8 0
J. W. Gray & Sons	300 0 0
T. Potter & Sons	299 0 0
Speedy, Eynon, & Co.	295 0 0
National Telephone Co.	275 0 0
H. J. Galliers	257 1 11
J. Bryden & Sons	248 10 0
The Private Wire & Telephone Installation Co., Ltd.	226 0 0
Electrical Engineering & Maintenance Co., 49, Lime-street, E.C.*..	175 0 0

DUNSTABLE.—For erecting new Council school for infants, for the Bedfordshire County Council. Messrs. Gotch & Saunders, architects, Bank-chambers, Kettering:—
O. P. Drever, Kettering* £2,320
[Lowest of ten tenders received.]

EAST HAM.—For furniture and fittings for the new Central Carnegie Library, High-street, South, for the Town Council. Mr. A. H. Campbell, Borough Engineer, Town Hall, East Ham. Quantities by the Borough Engineer:—
W. Walker & Sons, Ltd., 119, Bunhill-row, E.C.* £615 14
Sectional Bookcases and Shelving.
Library Supply Co., 181, Queen Victoria-street, E.C.* 161 8

EXMOUTH.—For foreman's house at existing filter beds, for the Urban District Council. Mr. S. Hutton, Surveyor and Water Engineer, Council Offices, Exmouth. Quantities by the Engineer:—
W. F. Stokes, Exmouth* £333 4 6

EXMOUTH.—For 240 tons of mains and specials, etc., for the Urban District Council. Mr. S. Hutton, Surveyor and Water Engineer, Council Offices, Exmouth. Quantities by the Engineer:—
Pipes and Specials, Bill No. 1.
Sheepbridge Iron Co., Chesterfield* £1,410 5 9

EXMOUTH.—For the construction of reservoir, filter beds, meter house, laying of pipe line, etc., for the Urban District Council. Mr. S. Hutton, Surveyor and Water Engineer, Council Offices, Exmouth. Quantities by the Engineer:—
Hardy, Bate & Co., West Cliff, Herne Bay* £2,747 7 5

FRITCHLEY.—For 450 yds. of 9 in. pipe sewers, etc. (Fritchley, in the parish of Crich), for Belper Rural District Council. Mr. R. C. Condon, Engineer and Surveyor, Duffield:—

G. Holmes	£182 9 0
J. & J. Warner, Mickleover, near Derby*	177 9 0

GRAVESEND.—For the enlargement of the post office:—

		Credit.
Beal & Hubbard	£2,894	£49
J. Milton & Wallis.....	2,550	25
G. Gates & Sons	2,500	11
W. P. Goose & Sons	2,480	50
J. Lonsdale.....	2,391	10
W. Archer & Son	2,388	52
H. E. Phillips.....	2,368	18
L. Seager.....	2,349	60
A. E. Tong.....	2,287	27
Hyde & Co.	2,209	—
F. Miskin, Ltd.	2,165	nett.
Pavitt & Sons.....	2 050	50

HAVANT.—For altering existing drains and laying down new ones, etc., in the grounds of the hospital in Park-road, for the Havant Joint Hospital Board. Mr. A. E. Stallard, F.S.I., Park-road, Havant:—

R. H. B. Neal, Ltd.	£246 0 0	H. Munday	£170 15 4
R. J. Tucker ..	225 0 0	G. & R. Currell	155 0 0
H. W. Wiggins	208 18 3	Rogers Bros., Havant*	135 5 0
G. Davis	175 18 6		
J. Edwards & Son	172 0 0		

HOUNSLOW.—For private street works at Clare-road, for the Heston and Isleworth Urban District Council. Mr. J. G. Carey, Engineer and Surveyor, Council House, Hounslow:—

R. Dykes	£191 15 6	R. W. Swaker..	£159 8 0
Fry Bros.	171 13 10	T. Adams	153 6 7
Potter & Co. ..	163 18 0	T. Chapman ..	150 0 0
S. Kavanagh & Co.	163 2 5	J. Mowlem & Co., Ltd.....	148 6 5
W. Muirhead & Co.	163 0 8	M. Thacker & Co.	147 16 6
G. R. Mann ..	162 0 0	T. Watson, jun., Southall* ..	147 0 0
T. Free & Sons	160 14 8		
W. Griffiths & Co., Ltd.....	160 6 10		

HOUNSLOW.—For private street works at Standard-road, for the Heston and Isleworth Urban District Council. Mr. J. G. Carey, Engineer and Surveyor, Council House, Hounslow:—

R. Dykes	£2,866 5 0	R. W. Swaker	£2,346 8 3
Fry Bros.	2,637 0 0	J. Mowlem & Co., Ltd. ..	2,322 5 0
S. Kavanagh & Co.	2,538 14 3	T. Adams.....	2,275 10 9
W. Griffiths & Co., Ltd. ..	2,494 6 2	M. Thacker & Co.....	2,237 8 6
G. R. Mann ..	2,480 0 0	T. Chapman..	2,228 5 0
Potter & Co...	2,461 3 2	T. Watson, jun., Southall* ..	2,133 0 0
T. Free & Sons	2,455 13 0		
W. Muirhead & Co.....	2,355 15 5		

HOUNSLOW.—For private street works at Cecil-road, for Heston and Isleworth Urban District Council. Mr. J. G. Carey, Engineer and Surveyor, Council House, Hounslow:—

R. Dykes....	£1,262 8 7	Potter & Co.	£1,038 0 1
Fry Bros....	1,159 10 8	T. Free & Sons	1,014 10 0
W. Muirhead & Co.....	1,125 12 1	M. Thacker & Co.....	961 5 4
W. Griffiths & Co., Ltd. ..	1,099 18 4	T. Chapman	954 16 7
G. R. Mann	1,055 0 0	J. Mowlem & Co., Ltd...	947 17 11
W. E. Rhodes	1,050 0 0	T. Adams ..	964 12 0
S. Kavanagh & Co.....	1,043 8 3	T. Watson, jun., Southall*	861 0 0
R. W. Swaker	1,042 0 8		

HOUNSLOW. — For wood-paving with hardwood blocks, about 562 sq. yds. of roadway at the junction of Bath and Staines roads, for Heston and Isleworth Urban District Council. Mr. J. G. Carey, Engineer and Surveyor, Council House, Hounslow:—

Potter & Co.	£677	0	4
R. Dykes	590	16	9
W. Muirhead & Co.	571	4	2
M. Thacker & Co.	560	9	0
T. Adams	559	10	0
Fry Bros.	530	0	4
S. Kavanagh & Co.	529	13	0
J. Mowlem & Co., Ltd.	525	3	11
Acme Flooring & Paving Co.	509	16	8
Improved Wood Pavement Co., Ltd.	508	5	4
W. Griffiths & Co., Ltd.	505	19	4
T. Watson, jun., Southall*	440	0	0

IVYBRIDGE (Devonshire).—For alterations and additions to Council School, for Devon County Education Committee. Mr. P. Norris, County Architect (Education), Exeter. Quantities by S. W. Haughton, 22, Courtenay-street, Plymouth:—

Wakeham Bros.	£1,577	0	0
Stevenson & Co.	1,511	5	0
Sincock & Blight	1,421	0	4
J. Crockerill	1,394	10	0
Lapthorne & Co.	1,374	0	0
G. B. Andrews	1,352	10	9
A. Andrews	1,344	10	0
R. E. Narracott	1,330	12	8
R. C. Williams	1,323	7	8
F. J. Standbury	1,307	6	9
W. E. Bennett	1,296	5	0
G. B. Turpin	1,287	0	0
W. E. Blake	1,263	0	0
G. P. Finch	1,209	12	0
Pethick Bros.	1,196	2	0
D. Carwithen	1,194	5	11
F. J. Badcock	1,175	12	5
F. A. Truscott	1,144	16	0
J. Paynter, Plymouth*	1,139	15	0

[Architect's estimate, £1,270.]

KINGSTON-ON-THAMES.—For the erection of a new telephone exchange:—

J. Cassé	£6,888	F. & H. F. Higgs	£5,785
Fire-Resisting Corporation, Ltd.	6,659	Cropley Bros., Ltd.	5,737
J. Lawrence	6,599	J. Shelbourne & Co.	5,675
Collinson & Co.	6,549	F. G. Minter	5,636
A. Leather	6,097	Mc. E. Fitt	5,585
J. Garrett & Son	6,043	Jarman, Daws, & Co.	5,555
Drowley & Co.	5,889	W. H. Gaze & Sons	5,497
F. & G. Foster	5,844	Cropley & Sons	5,318
Martin, Wells, & Co., Ltd.	5,840	F. G. Lawrence	5,275
C. W. Cox & Sons	5,795	Patman & Fotheringham, Ltd.	5,223
		Wisdom Bros.	4,987

LETTERKENNY.—For additions and alterations to Manse, at Convoy, for Rev. J. Beattie. Mr. J. McIntyre, architect, Letterkenny:—

G. Kelly	£518	5	
S. Donnell & Co.	480	0	
J. Johnstown	377	14	
E. Brolly	368	12	
J. M'Grath	£363	9	
W. M'Quade, Convoy*	360	9	

LONDON.—For engineering plant at North Eastern Hospital, Tottenham, for the Metropolitan Asylums Board. Mr. W. T. Hatch, Engineer-in-Chief:—

Lancashire Heating Co., Ltd.	£13,800	0
Thames Ironworks, Shipbuilding and Engineering Co., Ltd.	8,747	0
E. Danks & Co.	8,571	13
Brightside Foundry & Engineering Co., Ltd.	8,497	0
E. Le Bas & Co.	8,340	0
Holdsworth & Sons	8,235	0
G. N. Haden & Sons	8,169	0
Dargue, Griffiths & Co., Ltd.	7,951	0
Cannon & Efford	7,950	0
G. & E. Bradley	7,610	0
Moorwood, Sons & Co., Ltd.	7,500	0
T. Beeley & Son, Ltd.	7,450	0
Z. D. Berry & Sons	7,250	0
T. Potter & Sons, Ltd.	7,223	0
J. & F. May, 33, Whetstone Park, Lincoln's Inn Fields, W.C.*	6,985	10

LONDON.—For rebuilding No. 12, Pulteney-street, Barnsbury, N. Mr. George Carter, 513, Holloway-road, N., architect for the Trustees of the property, being the first section of the scheme for rebuilding the estate:—
Weibking & Co., 401, Kingsland-road, N. £630
[Architect's estimate £625.]

LONDON.—For alteration and additions to manufacturing premises, Brick-lane, and Wentworth-street, E. Messrs. Fuller, Horsey, Sons, & Cassell, Surveyors, 11, Billiter-square, E.C.:—

Parrott & Isom	£5,615	A. Owers	£2,975
F. & F. J. Wood	3,765	Wontner, Ltd.	2,963
Taylor Bros.	3,470	Hawkey & Oldman*	2,665

OAKENSHAW.—For the erection of conveniences and boundary wall at Oakenshaw Woodlands School, for the Manager. Mr. J. W. Broughton, Estate Office, Gargrave. Quantities by Mr. J. W. Broughton:—

Mason: W. Tait & Sons, Marshfield Bradford*	£99	14	9
Joiner: J. Priestley, Oakenshaw*	5	13	4
Plumber: H. Oak, Oakenshaw*	10	9	0

RAINHAM.—For making-up, etc., Melville and Cowper roads, for the Romford Rural District Council. Mr. E. G. Boden, Surveyor to the Council, Victoria-chambers, Victoria-road, Romford:—

A. T. Catley	£1,607	J. Jackson	£1,323
Willis & Powis	1,498	D. T. Jackson	1,268
W. Griffiths & Co.	1,451	Wilson Border & Co.	1,245
Buxton & Jenner	1,428	H. F. White, Hornchurch*	1,228
S. Gibbons	1,418	T. Wood & Sons	1,225
T. Free & Sons	1,333		

[Surveyor's estimate, £1,454.]

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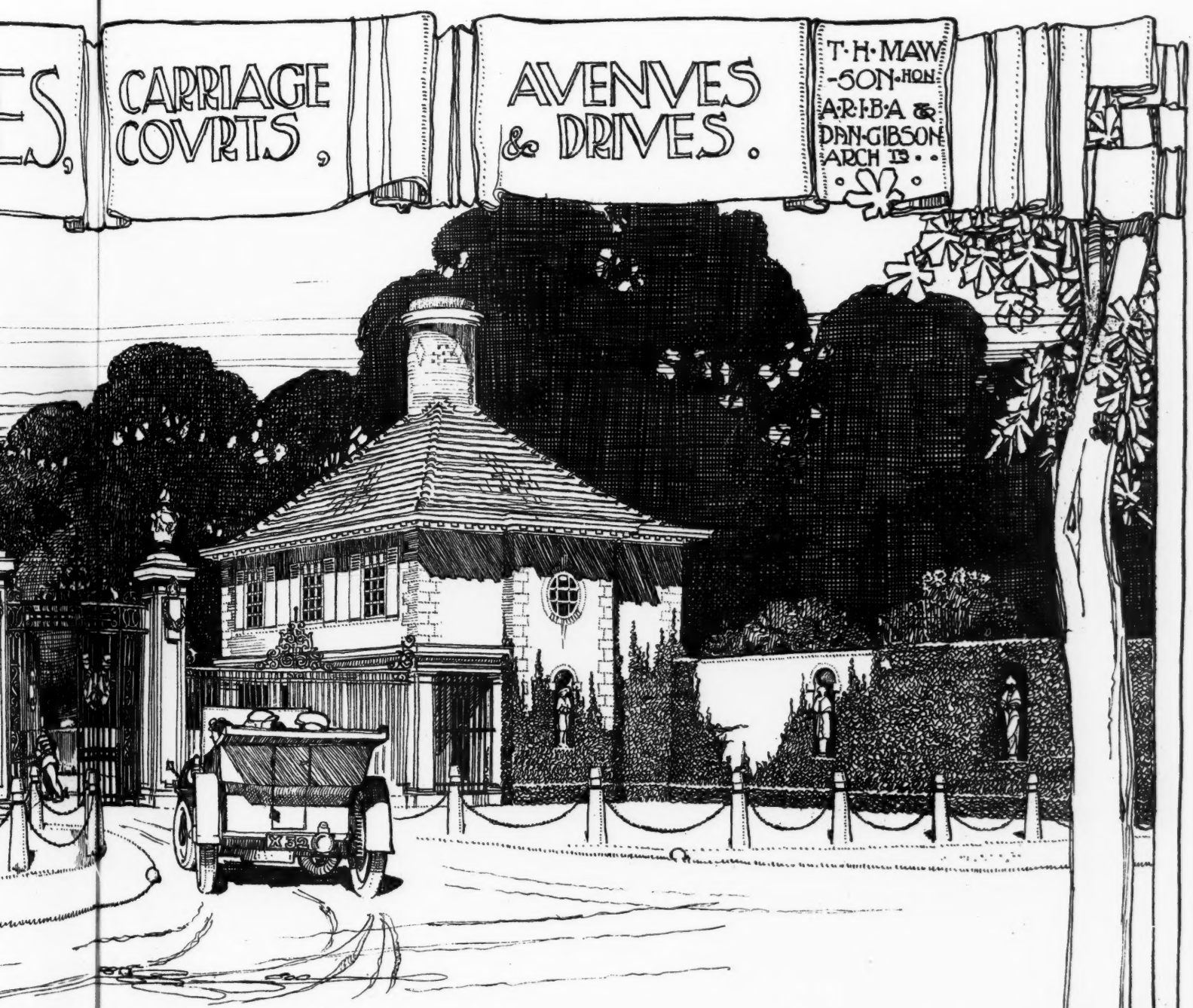

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